THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. 84. NEW YORK, SATURDAY, JANUARY 2, 1904. NO. 1.

ORIGINAL ARTICLES.

THE MANAGEMENT OF TYPHOID FEVER EPIDEMICS.*

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IT has been said that for every epidemic some person should be hanged. This, like many other epigrams, contains a germ of sense, but upon analysis is found to contain a misconception. If it were customary to hold public officers strictly responsible for their acts and health boards were as familiar with the principles and precepts of hygiene as they are generally supposed to be, there is no doubt but that some person or persons would be punished as a result of most of our typhoid fever epidemics.

As it is, however, we act very irrationally about the whole matter. We first attribute to health boards a knowledge which they should not be expected to possess and then excuse them from responsibilities which the law has clearly placed upon them.

It is well to consider how health boards are constituted. The boards of health of cities are usually appointed by the mayor and confirmed by the council. In villages the health board is commonly appointed by the village trustees, although the trustees themselves or the president and council of the village may act as a board of health. The local boards of health of towns are constituted in various ways: the township board, consisting of the supervisor, two justices of the peace and the town clerk, may constitute the health authority, or the board may be elected by popular ballot. The boards usually meet at regular but infrequent intervals to transact such business as is brought before them. The proper transaction of this business requires the exercise of much tact and discrimination in order that the action of the board may be, on the one hand, just and sufficient, and on the other, not so severe as to entail unnecessary hardship and expense, but a knowledge of public hygiene is seldom thought to be needed. It is customary for one of the members of the board to be a physician, but beyond this no scientific nor technical knowledge is required of the members. As a rule, there is no salary attached to the office, service being rendered voluntarily and without remuneration of any kind. Because sooner or later public duties and private interests are very apt to conflict, membership, although regarded as an honor by those who do not possess it, often comes to be looked upon by the members themselves as a thankless and unpleasant service.

The most remarkable power is everywhere given to local boards of health for the performance of their duties. The law requires the use of all possible care to prevent the spread of infectious diseases, and where there is a divided opinion as to the sufficiency of means for the protection of public health, the law is that the more effective measure is to be adopted. If the circumstances require, the board of health has authority to enter upon private property and remove and destroy, and not simply disinfect, articles of clothing, furniture and bedding which may be thought to be tainted with infectious material. Persons may even be seized and restrained from their liberty, private houses converted into hospitals, and many other things done which under ordinary circumstances would be considered a gross outrage upon the rights of persons and property. The safety of the people is the supreme law.

For an improper exercise of the large powers which are vested in local boards of health, severe penalties are provided. Health officers do not possess any special immunity from responsibility for wrongful acts, as, for example, the performance of duties in a grossly negligent, reckless or otherwise improper manner.

Such skill in sanitary science as is possessed by the board is usually represented by an employe. It is the duty of every local board of health to appoint a competent physician, not a member of the board, to be health officer and to act as the sanitary adviser and executive officer of the board. Among the duties which devolve upon the health officer may be named the following: to carry into effect the sanitary laws; to cause every case of infectious disease to be reported immediately and to transmit the same to the state department of health without delay, to keep the local board of health informed concerning dangerous diseases; to discover and remove preventable causes of disease, and to this end to direct, under the authority of the local board, an efficient system of sanitary inspection; to receive and examine into the nature of complaints concrning nuisances and causes of danger to the public health; to supply the local board with a knowledge which will enable them to make public, information which may be useful in the prevention of disease and the removal of injurious conditions.

Theoretically, the health officer directs the active work of the board of health. He should be skilled in sanitary science, and should be able at all times to give and apply an accurate knowledge as to the causation of infectious diseases and the most approved methods of eliminating them.

*Read at the Third Annual Conference of Health Officers of New York State, Albany, October 9, 1903.

The health officer should have special training in bacteriology, chemistry, pathology and sociology in order that he may be properly prepared for his duties. Since his position is one of great responsibility, he should be well paid. As a matter of fact, his salary is usually less than one dollar a day, excepting in the larger cities. It is no wonder that the best men are not always available. Yet good men are needed to prevent epidemics.

It is a misfortune, and, I think, somewhat of a reflection upon our universities and medical schools, that a scientific training in hygiene and sanitation can scarcely be acquired in this country. It is not so in Europe. In England, health officers are required to have a diploma testifying to their fitness for the duties to which they are appointed. On the continent, nearly every university of importance has its professor and department of hygiene, while in some countries there are whole institutions devoted to the study of the cause and prevention of disease. In America, we have no training school for health officers, we have no degree of doctor of public health, and, although our state demands a knowledge of hygiene before granting a physician a license to practice, there is scarcely a school of learning where such a knowledge may be obtained. So long as our educators remain blind to the need of disseminating a knowledge of this important subject, we cannot expect high standards of efficiency in our boards of health. If the responsibility for typhoid epidemics were pressed home as in the adage, I believe that the universities would, in many cases, occupy prominent places at the hanging.

But the title of the present paper indicates that our attention is not to be directed so much to the prevention of epidemics as to their suppression. What shall be done when an epidemic has arrived? The first thing is to know when a real epidemic is on. Usually a rumor that an infectious disease is spreading rapidly through a community is the first intimation of trouble. This is followed by denials from interested persons whose business is threatened by the public fear. Sooner or later the facts insist upon acknowledgment and it is confessed that an epidemic has broken out.

The pendulum then swings the other way. Exaggerated tales of the progress of the disease gain circulation. If the epidemic is not soon checked, symptoms of panic become observable. The number of cases is probably not accurately known. To the physicians the disease may be of an unknown, or practically unknown, character. Many epidemics of typhoid fever are not recognized in the beginning to be typhoid, because of the large variety of puzzling symptoms which this disease frequently presents. We have heard typhoid fever pronounced to be each of a score of other diseases, the majority of them hitherto unknown and unrecognized in medical practice.

In the first hours of uncertainty and dread which follow the outbreak of an epidemic, it is imperative that the health board act with wisdom and celerity. Nothing can do more good than to take prompt steps to determine the presence and nature of the disease. In the diagnosis of typhoid fever, reliance should never be placed upon clinical symptoms alone, where these seem to be uncertain in character or masked by symptoms which baffle the judgment. To be on the side of safety, it is desirable that all cases of continued fever not positively diagnosed, when prevalent in a community, be regarded as suspicious of typhoid, and the patient and his surroundings regulated in a way that will prevent the disease spreading if the provisional diagnosis is correct. It is important that these provisional diagnoses be promptly made and reported to the local board of health. On or after the seventh day, if doubt still exists, samples of blood should be taken to be tested by the Widal reaction. Microscopic slides, with full directions for their use, may be obtained from the headquarters of the State department of health at Albany. These slides can be had in any reasonable number. They will be examined free of charge by the State department and the results communicated to the local board of health upon request.

As practitioners at large are not in the habit of making use of this aid to the diagnosis of typhoid fever, a word should be said as to the interpretation of the Widal results. If the report of a specimen of blood sent to Albany indicates that the Widal reaction was positive, it is safe to conclude that the patient whose blood has been examined has typhoid fever or has had that disease within a recent period. If the report of the Widal test is negative, it is not to be inferred that the patient has not typhoid fever; it may be that the sample was taken before the blood assumed its typhoidal character. In the event of a negative report, it is desirable that another specimen of blood be taken for analysis. It is not to be forgotten that the blood will probably not react before the seventh day of the disease, and that it may persist for several weeks and months after apparent recovery. When utilized to the fullest extent, the Widal test can be of the utmost value at the outbreak of an epidemic of a disease which is suspected to be typhoid.

When an epidemic of typhoid fever has settled upon a community and it has become apparent that some more than ordinary measures of public safety are required, it will be desirable that the local board be strengthened to meet the emergency. The question arises at once, how this can be best accomplished. It may be that the board contains within itself sufficient initiative and executive ability to bring about such changes as may be necessary. When local boards can rise to the emergency of a typhoid epidemic without unnecessary sacrifice of time or money, there will be no need of obtaining outside assistance. In most cases, however, it is believed that boards of health, when confronted by epidemic conditions,

will desire to obtain help if prompt and capable assistance can be secured.

Fortunately, provision exists for the assistance of stricken communities in this emergency. The state department of health, which by law exercises supervision and authority over local boards, may be called upon for aid and for such advice as may be needed in order to control the epidemic. A desirable way by which the state department of health may furnish assistance to a local board is through an expert representative. The representative should be provided with ample power and authority by the state department, and should act under broad instructions to secure the introduction of such measures as are most suitable and appropriate, the fact being clearly kept in mind that an epidemic of typhoid fever in any locality is liable to spread to other communities. The status of the representative of the state department of health should be clearly defined. His duties should be considered as simply advisory so long as effective work can be carried on by the local board, in this manner. The existing law of New York permits the commissioner of health of the state to dissolve incompetent local boards, and to appoint health authorities to carry on the functions of the local board when thirty days have elapsed without a new board being appointed. It would be desirable if the state department could authorize the representative to take charge without so long a delay. If, however, the circumstances warranted it, there is little doubt but that an immediate assumption of the desired sanitary control would be upheld by the courts.

Except in the most extreme cases, it is distinctly preferable for the state's expert to consider his duties to be those of an observer and an adviser, taking account of all matters connected with the epidemic, and giving counsel and instruction and initiating sanitary measures in an amicable manner. The advice is pretty certain to be accepted as the surest means of relief at hand. It was in this way that the local board of health at Ithaca was supported to meet the severest epidemic that this state has known for many years.

The second step in suppressing an epidemic of typhoid fever lies, in my view, in determining accurately how many cases of sickness there are, where they are distributed and when they occurred. There is no more indispensable feature connected with the control of an epidemic than the collection and intelligent analysis of the vital statistics. Although the laws specify that physicians shall report their cases of infectious disease to the local board of health, many are not, under ordinary circumstances, in the habit of notifying their cases accurately or promptly. In times of epidemic it is imperative that the health authorities make a special effort to have reports sent in in the most accurate and punctual manner. There are many ways in which to obtain these reports from the physicians: the law, which is binding upon the physicians, may be enforced, or the local board may seek to obtain the co-operation of the physicians in a friendly spirit. The latter method is preferable, especially in small communities, but in larger cities, where public health work is generally carried on with less regard for personal relations, the prosecution of a delinquent physician may be the most practicable way to obtain the needful data from the rest.

The facts collected from the physicians' reports should be carefully digested. Maps on as large a scale as feasible should be used to plot the location of fever cases, and tables should be made to embody the results in chronological order, as well as by sections of the city, village or town.

Special care should be taken to detect the existence of mild, unusual and atypical cases, since an epidemic is not so likely to spread from the severe cases as from the mild ones. It should be remembered that all kinds of transmissible diseases which ordinarily escape detection by the family physician are the most dangerous to the public. It is not the patient who is sick in bed and under the control of doctors and nurses, but the one who is well enough to travel in street cars, attend church services and other public meetings and, in short, be about his business and pleasure in nearly his usual manner, who is most likely to spread disease. The State's expert should be prepared to visit and consult with the local physicians in the diagnoses of all suspected cases, and should take such independent measures to detect mild or aberrant forms of the epidemic disease as are in his judgment proper.

At the earliest practicable moment, the original cause of the epidemic should be looked for in order that it may be removed if it still exists. In most cases in which an epidemic has progressed to alarming proportions, the first cause will have disappeared and many local foci of disease taken its place. In this event, the difficulty of investigating the sources of disease germs is greatly increased. It is important that each center be detected and surrounded with such protective measures as will effectively prevent the further spread of the fever.

It is well for the local board of health to remember that in investigating and inspecting premises on which dangerous or injurious conditions are thought to exist, the jurisdiction of the local board must not be overstepped. The jurisdiction of local boards of health extends no farther than the limits of the corporations from which their authority is derived. The health officer of a city or village has no legal right, unless by special authorization, to enter upon premises located in a neighboring city or village, or upon property in a township, even though the township limits include the city or village from which he may derive his authority. If, as frequently occurs, a health officer desires to make inspections in the territory which supplies his corporation with drinking water, milk or other commodity, authority for such inspections

must be obtained from the municipal corporation concerned or from the state department of health.

As food supplies play such an important part in the spread of typhoid fever, it may be well to repeat that local boards of health may control the purity of these articles by regulations covering the quality of these products as they are offered for sale in the city.

As disinfection on a large scale will generally be required in a typhoid epidemic, it is desirable that the board of health prepare and distribute disinfectants of standard quality, without charge, to all houses where sickness exists. Analysis of many samples of proprietary disinfectants on the market shows that they are often too much adulterated to be depended on. An indiscriminate use of disinfectants should be discouraged. It is preferable that a great deal of attention be given to their proper application. The choice of disinfectants to be employed and the manner of using them are matters upon which the representative of the state department of health should be qualified to advise. Milk of lime, made by adding four parts of water to freshly slaked lime, and bichloride of mercury, prepared one to one thousand, are among the most suitable disinfectants to be employed. The milk of lime should be used for the disinfection of excreta and urine, and the bichloride of mercury for all other purposes. In all cases, the destruction of infectious material should be carried on as near its source as possible. If the disinfectants mentioned are properly used, fumigation will not be necessary. Where fumigation is indispensable, formaldehyde, used by sprinkling the 40-per-cent. solution of formalin on a bed sheet in the proportion of one quart to a thousand cubic feet of air space, is recommended. In general, it will be disadvantageous, in my opinion, to employ those chemical agents which are properly termed deodorants or counterodorants. The use of germicides which have a distinct odor is regarded unfavorably by me.

A recent contribution to our knowledge of the infectivity of typhoid fever is that the urine may contain enormous numbers of typhoid bacilli, and that the infection of the bladder, which is the cause of this condition, may remain after the patient has been discharged by his attending physician. The percentage of cases in which the urine becomes infected is probably small, but the danger of spreading the disease through this channel makes it important that it be recognized. For the disinfection of the bladder, the use of several drugs has been recommended. Urotropin, given in 10-grain doses three times per day for a week, has been found to be effective.

Along with the more scientific work of checking the epidemic will probably come a popular movement for a municipal house-cleaning. To encourage this can do no harm; indeed, it is desirable that the public should be requested to cooperate and assist the health work in all possible ways. It is partly for this reason that the investigation of complaints made by citizens should form a conspicuous feature of the work of the sanitary organization. It is even advisable that inspectors be delegated to various districts to inquire into the sanitary conditions before they are complained of. Responsibility rests upon the board for prompt and just action in the suppression of nuisances. It is their duty to ascertain when conditions answer to the definition of nuisances, as defined by the sanitary ordinances. But care should be taken here, as in other directions, that the authority of the board be not exceeded.

Inasmuch as the expenses of local boards of health are met in the same way as the expenses of the other divisions of the local government, unless otherwise especially provided for by law, the local board, in time of epidemic, will need to obtain funds for its work. The board should obtain authority for the expenses necessary to accomplish the business in view. Failing in this, they may proceed independently, and the obligations incurred in the event of the performance of necessary work for the protection of the public health at a time of great emergency will bind the city, village or town which is concerned. The expense of disinfecting private premises and of furnishing medical attendance and nurses is properly chargeable to the patient himself, unless he is confined involuntarily or is a pauper, in which event the expense is chargeable to the county or town.

But to catalogue all the duties of the health authorities in the management of a typhoid fever epidemic is beyond the range of the present paper. Such a treatment of the subject might well constitute a treatise of formidable length. Typhoid fever in a small village, extended township or large city is a disease which, when in epidemic form, will require very different treatment in detail in order to accomplish its suppression. Local circumstances will always exercise a governing influence in determining just what steps should be taken. The foregoing remarks, therefore, are not intended to be in any sense a program, but are rather given for such suggestions as they may contain and in order to show that local boards of health, when overwhelmed by the difficulties which attend the outbreak of a typhoid fever epidemic, may appropriately apply for assistance to the State department of health.

I am aware that in expressing an opinion favorable to what may be considered a state management of epidemics I am recommending a course which appears to be different from that ordinarily followed in this commonwealth. But the difference is more seeming than real. It has been the custom on occasions of severe epidemic for the state department of health to send a representative to investigate the cause of trouble and to recommend measures for the elimination of the cause. The visit of the expert has usually been brief, two or three days ordinarily being considered sufficient for his investigation. The suggestion that I make is that the state send a representative to remain long enough at the seat

of epidemic to insure the adoption of measures which will bring it under control, whether this takes three days or three months. This suggestion, if adopted, would be in reality a development of the established custom of the state department of health and embodies no new features except an increase in the duties of the representative of the state and a corresponding increase in his authority in order to meet the requirements of the situation.

ANOMALIES AND DIFFICULTIES OF DIAGNOSIS IN TYPHOID FEVER.

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ANOMALIES in the course of typhoid fever have ceased to surprise us. There are but few cases in which the critical eye fails to discover some anomaly. The difficulties of diagnosis, as a rule, end with the first seven or eight days of continuous symptoms. The type of the disease is likely to vary from year to year. There are some years of mild, others of severe and malignant types and still others in which are found all grades of severity. There is no acute infection which we meet in Central New York more *atypical* than that due to the *Bacillus typhosus*. Successive epidemics are likely to have some characteristic manifestations which cause them to differ from those of the previous years. The typical descriptions of Griesinger, Liebermeister, Lebert, Murchison and a score of other acute observers are not usually prototyped on this side of the Atlantic. Erratic, irregular and unique forms of the disease are interspersed with a majority of cases corresponding with the textbook résumé of our own splendid American authors.

In 1842 Bartlett in his work "On Typhoid and Typhus Fevers" despaired of our ability ever to be able to make an absolute diagnosis. He said, "Our diagnosis can never be founded here, as it is in many other instances, on a few positive physical signs. It must always be rational—not absolute. The evidence upon which our verdict is to be rendered is wholly circumstantial."

Murchison in his classic work says: "During the first week of the disease it may be impossible to make a positive diagnosis; but even then enteric fever may be suspected if there be pyrexia, with nocturnal exacerbations each night becoming more severe and especially if this be attended by diarrhea, enlarged spleen or epistaxis." Less than ten years ago if both the abdominal symptoms and the eruption were absent, the diagnosis of enteric fever was only reached by a "process of exclusion." It became necessary to compare symptoms with those of many other diseases with which typhoid was likely to be confounded and the majority of physicians clung to the Murchisonian rule that "a fever which persists beyond seven days and is unattended by cutaneous eruption, or by signs of local disease in the head, chest or elsewhere, is in all probability enteric fever, though there be no symptoms of intestinal lesions." This latter statement led to a decided advance in diagnosis and proved the clinical acumen and thoroughness of the author. Murchison adds "almost the only source of fallacy is latent tuberculosis." How eager would both Bartlett and Murchison have been to rewrite the chapter on the Diagnosis of Typhoid, if they had but lived to know of the conquests of bacteriology.

Yet the ever changing type of the disease; the irregularity of its invasion; the many foci from which the typho-toxin may overwhelm the victim, with the uncertainty of the life-history of the hardy disease-producing bacillus, the fact positively established, more important than the profession has yet appreciated, that typhoid infection need not spend its force in the intestinal tract, must of necessity obscure the clinical picture and were it not for the added knowledge gained by laboratory methods, we would still find ourselves unable to establish positive diagnoses in many of our cases until a period so late that these could as readily be made by the layman as by the scientist.

There is abundant proof that typhoid may recur in the same individual. The history of a previous typhoid ought never to preclude the consideration of a second attack. Our information may not always be accurate. On the other hand we must not forget that in some cases the blood of typhoids continues to show the characteristic reaction long after the acute disease. This may become decidedly misleading. In a Sister of Charity examined in St. Joseph's Hospital, in Syracuse, who was perfectly well, the characteristic reaction was present eighteen years after typhoid. The fact to be kept before our mental vision in considering this question is that the acquired immunity of typhoid is not of as long duration as is that of most other exanthemata and it is positive that this immunity does not protect during the entire life of the individual.

The study of the prodromal period of typhoid fever always interests us; it is replete with irregularities and has so many vagaries that with atypical symptoms during a few days following, we are puzzled and often much at sea. The invasion of the disease may cover a long period, during which there are vague symptoms none of which lead to more than a suspicion of approaching infectious disease. Indeed we have seen cases in which this prodromal period covered many weeks. Accurate thermometric measurements continued negative; the period was thoroughly afebrile; there were no localized abdominal symptoms; nothing but a feeling of ill health and malaise with occasional or continuous headache that foretold the approach of serious disease.

In another class of cases we are plunged at once from the prodromal period, which may not occupy more than two or three days, into the first week of the disease in which, without the characteristic rise of temperature, we have early

hyperpyrexia, delirium, with manifestations of profound involvement of the nervous system.

In still another class of cases the prodromal period is short; covers from three to four days and includes localized abdominal pains, often severe, slight diarrhea, temperature varies from 100° to 101½° F. and leads at once to a condition in which there are grave meningeal symptoms; the temperature rising from 104° to 106° F. per rectum, the pulse rarely above 100 and from this condition to a stage of hyperpyrexia, final increasing heart weakness, arterial tension below 100 mm., continual delirium, Widal reaction positive early, usually on the sixth day, increasing tympany, roseola on the seventh day; early incontinence of feces and of urine, which between the tenth and thirteenth days of the disease give way to constipation and retention of the urine. If the patient lives beyond the third week, the temperature is likely after that time to be almost normal; then during the next two weeks convalescence is satisfactory and uninterrupted. However, the majority of these cases do not rally from the profound nervous symptoms to which I have called your attention, but die without regaining consciousness, of cardiac asthenia between the fourteenth and seventeenth days of the disease.

Among the most malignant and anomalous cases are those—fortunately rare—of a foudroyant type. These are met in drunkards, those nervously reduced after prolonged worry and mental fatigue, in which there is practically no noticeable prodromal period but early high temperature and many symptoms of a rapidly fatal cerebrospinal meningitis. After the first forty-eight hours the arterial pressure falls below 100 mm.; the pulse is rapid; stupor is followed by coma in a few days, and the majority of these die before the tenth day. I have had occasion to autopsy a number of these cases and have found besides the usual typhoid lesions, marked cerebral congestions with in one abundant fluid in the ventricles of the brain. In all of these cases there were diagnostic features which aided materially. Among these we would emphasize the unusually tender and enlarged spleen, the great and early tympany, the copious diarrhea, with rectal and vesical incontinence, the hyperpyrexia, the absence of the Kernig symptom, the far-reaching evidence of profound sepsis and, finally, if the patient lived long enough, the positive Widal reaction.

I am reminded by several recent experiences connected with the Ithaca epidemic of cases in which the prodromal period is surprisingly short; the symptoms of the first week severe, the temperature reaching 104° F. During the first days of observation, the nervous symptoms are less profound than in the class of cases just described. The high temperature ends with the first week of continuous symptoms; the bowels become constipated and with a temperature during the two or three weeks following ranging from 101° to 103° F., most of the patients make a satisfactory recovery. With only a few days of high temperature, there is a fall of from one to two degrees in occasional cases and what appears to be a malignant typhoid becomes benign and leads to a favorable termination.

In connection with the study of the pulse it may be positively stated that in no other acute infection may there be such great disproportion between high fever and pulse rate. Uncomplicated cases show an average pulse not above 100. Typhoid may be considered a disease with low arterial pressure. We have recently made repeated observations of typhoids which have been admitted to St. Joseph's Hospital, Syracuse, and those seen in private practice, with the Riva Rocci instrument modified by Cook, and have satisfactorily demonstrated the truth of the statement that typhoid is a hypotensine disease.

Adult typhoid during the first week of continuous symptoms, shows the maximum blood pressure to be 130 to 140 mm. As the disease advances the pressure may fall to 100 mm. or even lower. In children the pressure is correspondingly lower. Thus a child aged twelve years, on the sixteenth day of the disease, during which the highest temperature had been 105.2° F. showed a blood pressure of 120 mm. At this time the temperature was 100.4° F., pulse 110 and respirations 25. A child of ten years, on the fifth day after admission, temperature 104.4° F., registered 134 mm. A young woman, aged sixteen years in the fifth week of the disease, during which the highest temperature had been 104.6° F., with normal temperature, respirations and pulse, showed blood pressure to be 135 mm. In children under six, the arterial pressure rarely registers above 100 mm. and usually lower.

Blood pressure study offers nothing of diagnostic value in typhoid; the only statement which we can positively make is that as the disease advances blood pressure falls, and at no time is it high without complications, usually abdominal.

In a correspondence which I have had with Dr. Briggs of the Johns Hopkins Hospital, who has made many interesting observations in connection with blood pressure, in typhoid and other diseases and to which I shall again refer in speaking of perforation, his observations and those made in the wards of his hospital agree fully with those which I have just mentioned.

During the first stage of the disease, the time when differential diagnosis is most needed the relative lowering and disproportion of the pulse and temperature is of greater value in diagnosis than is dicrotism. Dicrotism was present in the majority of our cases and is found oftener in typhoid than in other infections. A diagnosis ought never to be based upon the typhoid condition associated with dicrotism, for there are diseases in which the pulse continues dicrotic in which typhoid is simulated, dependent upon other than typhoid infection.

The association of a comparatively slow pulse, dicrotism, typhoid symptoms with enlarging spleen would naturally make us suspicious of ty-

phoid fever. In children with basilar meningitis, the pulse is rarely dicrotic, though slow and out of proportion to early high temperature, while the typhoid condition may be coexistent. In these cases the abdomen is retracted; there is constipation and usually with other characteristic symptoms the presence of the Kernig phenomenon. In the tuberculous form leucocytosis is absent, while those of pyemic origin, in which we are most likely to have typhoid simulated, there is a positive leucocytosis.

The large majority of our cases show but little variation in the leading symptoms, including characteristic behavior of the fever during the second and third weeks of continuous symptoms. Hemorrhages or perforation are always suspected when during these days we have a decided lowering of temperature.

Our temperature charts show a number of typhoids with decided and sudden drops to a normal and below without subsequent evidences of hemorrhage or perforation. In most of these cases we were unable from anything that transpired to explain this unexpected fall of the temperature.

In Central New York we are hearing less and less of gastric fever. Typhoids do occasionally begin with stomach and hepatic symptoms, then follows a so-called continuous fever with or without slight icterus, which soon shows the marks of a typhoid. In two of these cases we found typhoid cholecystitis which dragged a long and weary course. In none of these positive cases was the Widal agglutination delayed after the ninth day.

The close observer will note in the majority of cases during this prodromal period and the first days of the disease that the tongue is tremulous, this fibrillary twitching is characteristic and in doubtful cases with headache, slight enlargement of the spleen gurgling in the region of the ileocecal valve, has materially aided in strengthening a suspicion of typhoid before the Widal test became positive. I wish to accentuate the importance of this symptom, because I do not believe that sufficient attention has been given to it by the profession. This tremor is less marked in the typhoid condition associated with other infections.

In Central New York chills are the exception in uncomplicated typhoids. The diagnosis of typhoid must be surrendered if the patient has repeated chills. We have learned to exclude typhoid if with the chill there is leucocytosis and symptoms of infection. In cases where we have made the positive diagnosis of primary typhoid, secondary infection is usually present if chills persist. There are few cases in which repeated chilly sensations are absent; this symptom corresponds exactly with what the Germans speak of as "frösteln." We have no word in our language quite as descriptive of this symptom. Repeated chills with typhoid symptoms and even slight enlargement of the spleen during the early days of infection argue strongly against typhoid in favor of other infection. In connection with similar histories we have had very interesting experiences in some of which the diagnosis of typhoid had been made in which the leucocytic count and final physical examinations showed the presence either of endocarditis, malignant or benign, pus accumulation or some other form of grave infection. I shall later refer to the differential diagnosis of malignant endocarditis and typhoid. There are those who still believe that diarrhea and intestinal symptoms must be present before the diagnosis of typhoid is justified. During the prodromal period and the first week of the disease, we have often failed to find diarrhea.

In our study of 110 cases, diarrhea was present in 84 cases. Some of the anomalous cases have remained constipated throughout the entire course of the disease. The least valuable of all prodromal symptoms, formerly considered cardinal, is nosebleed. In the cases collected nosebleed was present in 49 cases. A small proportion of cases have had nosebleed late. This was occasionally an expression of a grave purpura.

The spleen gives valuable information, for in not a single case have we failed to detect its enlargement. I do not wish to convey the idea that we have been able to palpate this organ even in the majority of our cases. It seems to me that the American typhoid spleen is not as palpable as the German. Leube makes the statement that in 90 per cent. of his cases the enlargement is recognizable not only by percussion, but by palpation, if the examination is properly conducted. To this we cannot subscribe.

Our experience proves that young patients have larger spleens during typhoid than do adults and that the spleens of the latter if palpable at all are most likely to be so during the second week of the disease. It has been easier to palpate the spleen of children sick with the disease than young adults, for the proportionate enlargement of that organ is greater in infantile typhoid. I am aware of the fact that this has not been the experience of all observers, but a series of twenty cases of typhoid in children varying from ten months to ten years of age, closely observed, justify this statement.

In connection with the consideration of some of the anomalies of typhoid, we must mention the behaviors of the roseola. In but few of our cases have we failed to discover the eruption. In the 110 cases selected from hospital and private records which serve for the purpose of supplying the data for this paper, we failed to find the eruption in but 8 cases. In cases which have been observed, the appearance of the eruption was coincident with the seventh or eighth day of the disease. In some of our cases we have been forced to search diligently for the rose spots, so few being present and these at times in unusual locations. In a case observed before the days of the Widal test, in which there were many perplexing conditions, which masked the diag-

nosis, we finally found a single spot on the right wrist just before a copious intestinal hemorrhage.

In uncomplicated cases, we have never found the eruption hemorrhagic. Cases in which the diagnosis of typhoid fever had been made with ultimate hemorrhagic spots proved to be malignant endocarditis or some form of purpura either malignant or benign. Twice in our hospital experience we have had patients with enteric fever in whom we ultimately found *Roseola syphilitica*, coincident with the typhoid eruption; the typhoid infection having followed the syphilitic in from four to seven weeks, as near as could be estimated. Such experiences before the days of the agglutination test were puzzling.

In children, as well as in adults, scarlatiniform eruptions with typhoid have been noted, sometimes with throat symptoms, sometimes without. This may mask the diagnosis but with our present knowledge it would be possible even in the early stages of typhoid in similar cases and paratyphoids to reach definite conclusions from blood cultures, for the specific bacilli are present in the blood and can be easily demonstrated before the Widal agglutination. (Schottmüller, Rudiger.)

Hektoen emphasizes the value of this method of early diagnosis by the report of several cases; one in which typhoid was positively coincident with scarlet fever; two others in which there were suspicions of scarlet and typhoid in which the typhoid bacillus was readily demonstrated by culture experiment.

While the cultural method will readily confirm the presence of typhoid or paratyphoid, we will not quickly eliminate the diagnosis of associated scarlatina, a possible, though rare complication. The scarlatiniform eruption of typhoid will not ultimately desquamate and as De Costa demonstrated, it may persist or it may appear late, and return with relapses. It was present twice in twenty cases of children; in both it happened to be a late manifestation and followed the roseola.

In two per cent. of cases seen in private practice, I found the roseola eruption capped with a single vesicle at some time during its existence. Relapses have been, in the majority of cases, accompanied with recurring roseola.

In so-called ambulatory cases, the eruption has at times appeared after admission to the hospital (for most of these cases were hospital cases) or had been present before, or escaped detection. In none of our cases did we trace any relation between the number of rose spots and the severity of the disease.

There are but few cases of typhoid in which we fail to find some involvement of the sensorium, yet there are many which during the waking hours have the appearance of being absolutely clear mentally. A few anomalous but severe cases have remained comparatively clear during the febrile period to develop acute delirium later with mania and a long train of mental symptoms resembling the post-pyrexial mania of pneumonia. All of these have terminated favorably often after many anxious days.

In the series of cases under consideration there were two in which hemorrhages were severe and repeated before the end of the second week.

In December last I saw with Dr. Noyes, of New Berlin, a woman, aged forty-seven years, plethoric, who was thoroughly depleted by repeated severe hemorrhages before the eleventh day of continuous symptoms. The second case succumbed to an early profuse hemorrhage on the ninth day of continuous symptoms.

These cases may have been ambulatory for a longer or shorter period. Careful inquiry furnished no positive data. Cases in which there has been an unusually long period of indefinite symptoms, during which a feeling of ill health had not been considered of sufficient importance to claim the attention of the patient or physician, have occasionally been found with early hemorrhage and have shown great malignancy throughout the disease. The heart was weak from the beginning; the prognosis was unfavorably affected by early exsanguination. Two ambulatory cases came under observation moribund with perforation.

The diagnosis of abdominal conditions in typhoid is often exceedingly puzzling. No case of typhoid is so mild that perforation may not occur. There are no diagnostic means by which we can foretell the occurrence of perforation. There is no time after the beginning of ulceration until thorough cicatrization when in any case this may not occur without premonition. It is a positive fact that subjective and objective symptoms of perforation are not always associated with the rupture of an ulcer. All clinicians have been surprised by recovery of cases in which they had reason from the symptoms to suspect perforation. A localized peritonitis over a typhoid ulcer may exist before its perforation and may thus protect the free peritoneal cavity. A typhoid ulcer about to rupture may be covered by plastic material; the intestine may become adherent to a neighboring coil *without ultimate rupture* with symptoms of localized peritonitis only.

Griesinger many years ago, in his memorable article on typhoid fever made the following statement: "Evidently, in consequence of deep ulceration from within and sloughing, there frequently results, even before perforation, a localized inflammatory process, with adhesions of the inflamed patch to the neighboring intestinal coils. In such cases there is not at once perforation into the free peritoneal cavity. There is, however, a formation of circumscribed exudation, with or without suppuration, which may ultimately lead to a general peritonitis, though it may possibly remain circumscribed and gradually end in recovery. If there has been no adhesive process before the perforation, gas and intestinal contents escape into the free peritoneal cavity and general peritonitis immediately results."

In a paper read before this body "On the Perforation of Typhoid Ulcer with Adhesive and Protective Peritonitis," in 1892, the author re-

ported a case of perforation of a typhoid ulcer with adhesive and protective peritonitis in which the patient ultimately died of other intercurrent causes and in which a localized peritonitis with tumor simulated perforative appendicitis very closely. Post mortem showed adhesive localized peritonitis which served to protect the general peritoneum.

It will be difficult at times in some of these anomalous cases with perforation or with localized peritonitis early and tumor in the region of the appendix, to make a positive differential diagnosis. Prof. Fitz has collected 167 cases of perforated bowel in typhoid in which he found the appendix perforated in but five cases or a little less than three per cent. Murchison found this perforation only once in 39 cases. Morin found perforation of the appendix in 18.75 per cent. of typhoid perforations and Herschel in 14.3 per cent. It is difficult to reconcile the differences of the various writers. It would be easy to establish the existence of ulceration and perforation of the appendix with typhoid fever if it were frequent. The diagnosis becomes important in ambulatory cases in which patients come to the hospital with symptoms of perforation with tumor in the region of the appendix. In these cases a leucocytic count and the Widal test with a consideration of all that the case offers will not long leave us in doubt. An error of diagnosis would not prejudice the patient's chances for the aid of surgery would be invoked for either condition.

A number of years ago the elder Flint held that effacement of liver dulness was one of the most characteristic signs of perforation. It would be rather dangerous to accept this statement and base a positive diagnosis upon it. There are many cases of typhoid in which the abdomen is abnormally distended, with effacement of liver dulness in which there may or may not be evidences of localized peritonitis and yet perforation has not taken place. An unusually distended transverse colon may so modify the area of liver dulness in these cases as to cause tympany anteriorly over the area of normal liver dulness. On the other hand with perforation, adhesive inflammation, incapsulation, bands or from other causes, air may be held within a circumscribed area in the lower half of the abdomen without effacement of liver dulness. Careful examination of the abdomen will reveal the presence of the first source of error by placing the patient upon the left side and percussing in the axillary line on the right side over the liver from the eighth rib downward; the presence of free air in the peritoneal cavity showing itself by a disappearance of dulness in that line, while there would be a persistence of dulness if the anterior tympany had been caused by the distended transverse colon.

Mechanical irritation of the peritoneum during surgical operations causes a decided rise of systolic blood pressure; this can be established by means of the sphygmomanometer and is positive. Peritoneal inflammation either local or general from whatever cause, has the same effect on blood pressure during the early hours of its existence; a fact which proves of diagnostic value as the following shows:

Crile* reports: "In five cases diagnosed perforation, in which blood pressure determinations were made, four were verified either by operation or autopsy. The case not operated on was a typical one. The pressure rose from 116 mm. to 190 mm. during four hours. The second case, a lad of twelve years, was admitted to the Lakeside Hospital with general peritonitis. Blood pressure was 105; Widal reaction was positive. Immediate operation was performed and perforation found. Later the abdominal symptoms of peritonitis disappeared. The blood pressure fell to 80 mm. On the eighth day infection passed through the thinned wall of another ulcer, causing peritonitis; blood pressure then rose promptly from 84 mm. to 110 mm. In the third case, a patient in the ward at Lakeside, developed a slowly forming perforation, blood pressure rose from 116 mm. to 165 within two hours. The pulse in the meantime had but slightly increased. At operation a small perforation and diffuse peritonitis were found. The fourth case, that of a physician who entered Lakeside with general peritonitis, blood pressure was 165; no operation. Autopsy revealed perforation and diffuse peritonitis. The fifth case was one of typical perforation, blood pressure 208 mm. At operation perforation and diffuse peritonitis were found. The blood pressure in the perforation cases assumed the high level attending peritonitis from other causes."

Dr. Briggs,† of Johns Hopkins Hospital reported a similar experience in which the systolic blood pressure rose from 106 mm. to 144 mm., coincident with perforation proven by operation.

The results are suggestive and emphasize the importance of frequent daily observations of blood pressure in the course of typhoid fever that changes may be promptly noted and when considered with subjective symptoms and physical signs lead to an early recognition of localized peritoneal inflammation and intestinal perforation.

With repeated chills after typhoid and the persistence of fever, the involvement of the mesenteric glands in a process of suppuration must be kept in mind. Infections leading to prolonged typhoid sepsis may be continued by general pathologic changes or localized disease in one of many organs of the body with or without local symptoms. This is particularly true of typhoid infection of the bile passages and gall-bladder. Persistent jaundice in the course of typhoid must lead to repeated physical examination of the bile passages and gall-bladder for the purpose of detecting possible typhoid cholangitis or cholecys-

* Journal of the American Medical Association, 1902, page 1292.
† Boston Medical and Surgical Journal, Sept. 24, 1903, page 342.

titis. The differential diagnosis of nephrotyphoid and typhoid in which the albuminuria is due to a pre-existing chronic nephritis, without positive knowledge of previous disease, may be strengthened by the study of blood pressure. This fact we have recently demonstrated in a number of cases. There are at the present writing two cases of albuminuria associated with typhoid at St. Joseph's Hospital the one a pure nephrotyphoid, the other a typhoid with pre-existing chronic diffuse parenchymatous nephritis. The blood pressure in the latter has been uniformly high; at the height of the disease it registered 168 mm. The blood pressure chart shows no record below 140 mm., while in the nephrotyphoid the highest arterial pressure registered 130 and as the disease advanced, repeated tests showed the fall of the ordinary uncomplicated case.

Among the most difficult cases to differentiate are those of malignant endocarditis of the typhoid type which bear close resemblances to typhoid and paratyphoid infections. These are rarely diagnosticated during the early days of the disease, but are considered typhoid fever. This is also true of cases of malignant endocarditis in which there are no positive early physical signs of the disease. In the type of malignant endocarditis known as the chronic type, which may appear with acute typhoid symptoms, we have at least the previous history of endocarditis to guide us and are largely influenced by the mutability of physical signs and the associated secondary manifestations. The most difficult cases are those in which the primary infection is hidden in which typhoid symptoms develop and in which the endocardium may be plastered with vegetations before the valves are sufficiently changed to cause audible physical signs of endocardial involvement.

This statement is equally true of those cases of gonorrheal endocarditis, some of which have ended fatally in a few days or weeks with typhoid symptoms. There are cases of malignant endocarditis in which the typhoid condition has followed pyemic symptoms, bearing the closest subjective resemblances to typhoid fever. Profuse hemorrhage is unusual in malignant endocarditis. In connection with this subject one fact must always influence our diagnosis; it is the positive rarity of endocarditis as a complication of typhoid fever. The truth of this fact will be received without hesitation if the pathologic records of large hospitals and private practice are studied.

Considered collectively typhoid shows a surprisingly small number of permanent heart lesions during the acute febrile period or following. With evidences of endocarditis and the typhoid condition, we shall always feel justified in assuming that the disease is not typhoid fever. It is this knowledge which must serve as a fundamental principle in the differential diagnosis of these conditions.

In a paper "On the Resemblances of Endocarditis to Typhoid and Paratyphoid Infections," I made the following statements; which I repeat at this time, because clinical experience has repeatedly emphasized their truth. "In the presence of murmurs with infection, the presence of petechiæ, disturbed circulation, infarcts and leucocytosis, negative Widal, we may strongly suspect malignant endocarditis. To make the diagnosis positive ante mortem, we must have the presence of physical signs referable to the heart and these we have in the majority of our cases before death. The presence of embolic infarct is a valuable diagnostic fact; it means much. It matters not how few evidences of embolic infarct we have, if we have any, and these are associated with limited cardiac changes and the presence of few general symptoms, we are compelled to suspect the possibility of malignant endocarditis."

Transitory or even lasting paralyses in the history of acute general infections are exceptional, except in those processes associated with embolic detachment and consecutive tissue change. These are frequent in typhoid types of malignant endocarditis.

Chills are frequently present during the early days of malignant endocarditis. The pyemic type of this disease may suddenly assume typhoid characteristics. The involvement of the right heart out of all proportion to left sided disease, with typhoid symptoms always argues against typhoid and in favor of malignant endocarditis. Cases of chronic endocarditis previously recognized in which true typhoid infection is present show none of the changes so frequent in malignant endocarditis. Typhoid fever uncomplicated during the first week of its existence, is not associated with leucocytisis. Leucocytosis at this time with polymorphonuclear increase is always strong evidence of infection other than typhoid. The specific germ if found in blood culture experiments will often help us materially in recognizing not only the port of entry but will clinch the diagnosis as well. Repeated negative blood cultures make the presence of malignant endocarditis unlikely, while if the disease be typhoid or paratyphoid the cultural methods will give early positive results. The difference in the differential counts of the leucocytes in typhoid recently reported to the profession by Thayer and Higley respectively prove conclusively that we are not yet agreed on the morphological relations of these cells to each other in this disease. All observers are agreed however that in typhoid, the white blood count is not increased and that a positive leucocytosis associated with typhoid symptoms, argues strongly against typhoid fever. The spleen of typhoid is usually larger than is that of malignant endocarditis. It is clear then from the consideration of the differential diagnosis of the malignant types of endocarditis and typhoid that with repeated painstaking physical examinations, daily leucocytic blood counts, blood cultures and repeated Widal tests, the diagnosis

need not remain doubtful long, but can be accurately and positively made.

The diagnosis of infantile typhoid is rarely made positive during the early days of the disease. It is equally true that a large number of infantile typhoids remain unrecognized because of the failure of the physician to appreciate the fact that infants and children are oftener infected than was formerly supposed. Occasionally we find children attacked when the older members of the family have escaped.

The roseola may or may not be abundant. In twenty cases ranging from ten months to ten years it was positively present in 65 per cent. Occasional cases have presented large crops. A single rose spot was found in two of my cases. One case presented a scarlet eruption without final desquamation. Continued fever in a child without localized disease with enlarged spleen, must lead to the suspicion of typhoid.

We have met the remittent type of the disease to which Murchison called attention. Quinine formerly aided us in diagnosticating these cases; now the Widal test gives positive information before the eighth day, rarely later.

Experience justifies the statement of Murchison that idiopathic remittent fever in children is almost invariably enteric. Cases of infantile typhoid have rarely continued febrile beyond the third week. Intestinal symptoms have been frequent; nervous symptoms were present in the majority of cases.

The short course in children is undoubtedly due to the absence of extensive deposits in the submucous intestinal tissue and sloughing of the diseased patches in large masses as in adults. Fewer glands are involved. Generally speaking it may be assumed that the positive signs and blood conditions with characteristic reactions are as dependable as in adult life. Miliary tuberculosis, central pneumonia, sepsis, pyemia, meningitis, entercolitis, influenza and malarial poisoning can, as a rule, be differentiated in early as well as in adult life by careful attention to detail and the employment of such methods as are today used by every anxious and scientific observer; though occasionally owing to late reaction and other anomalous conditions there may be days of uncertainty.

Time does not allow the differentiation of each of the conditions suggested. I may be pardoned, however, for calling your attention to a few facts: Hurried respiration, with typhoid symptoms, and associated leucocytosis in children or adults, are opposed to the diagnosis of typhoid. Sudden, repeated, unexplained vomiting in children with a low continuous fever, a slow pulse, changed disposition, constipation with or without cerebral macule and absence of enlarged spleen, argue against typhoid, in favor of approaching tubercular meningitis.

A continued fever in a child or adult following an injury with or without chills and the typhoid condition must lead to thorough blood examination. If leucocytosis is present, whether the spleen is enlarged or not, typhoid fever may be excluded. Sepsis, pyemia or endocardial infection must be considered.

The Ehrlich diazo reaction is not of positive diagnostic value, though it is found in most typhoids. Its presence in diseases other than typhoids makes it of uncertain value. It arouses suspicion; can never confirm diagnosis, as do blood cultural methods and the Widal test.

It has been manifestly impossible, in the limited time at my disposal, to consider in detail more than a few of the anomalies and difficulties of diagnosis which, in practice, we are constantly facing. I have been content to limit myself to such conditions as have been found of greatest interest to the busy worker in the broad field of general medicine. If I have succeeded in demonstrating the diagnostic value of the association of modern scientific methods with accurate bedside observations, *without the surrender of a single clinical fact made positive by such study,* I shall feel that the object for which I have labored in this symposium has been accomplished.

MANAGEMENT AND TREATMENT OF TYPHOID FEVER.*

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THE consideration of the treatment of typhoid fever at the present time must seem to many of you like thrashing over old straw, so hackneyed is the theme. It is often of value to review our therapeutic beliefs and measures, and to see if they have kept pace with the advances in bacteriology and pathology; or whether, on the other hand, the old conception of the disease still dominates our treatment, and whether or not we have fallen into a routine method of treating our patients as soon as the diagnosis of typhoid fever is made.

I fear that in our treatment we too frequently lose sight of the fact that typhoid fever is a general infection with varying degrees of toxemia, and that the bowel lesion is not the prime factor, but only one of the pathological incidents of the disease, and may be entirely wanting.

Nursing.—It is necessary to insist on good nursing, for everyone concedes that more lives are saved by nursing than by any other part of the treatment, but we cannot always insist on the patient being taken to a hospital if the needed attention cannot be given at home.

For nursing to be efficient it must be skilled nursing and not that which can be given by the different members of the patient's family. Fortunately nearly every community is supplied with well-trained nurses. If the patient must be nursed at home by his family and friends, then it is our duty to see that it is not done by them indiscriminately according to the exigencies of

* Read at Symposium on Typhoid Fever October 14, 1903, at a meeting of the New York Medical Society.

the household work, but certain members should be assigned to this duty and the physician should insist that they be in attendance at regular hours and be relieved from all other household cares. If possible the room should have a sunny exposure and means for good ventilation. The bed should be protected against soiling, and if possible, the room should contain two beds, so that the mattress and coverings of one bed may be thoroughly aired and sunned each day. The covering of the patient should be light, and in private practice the physician should see that solicitous friends do not weigh the patient down with bed-clothes and so prevent as far as possible all heat dissipation.

There should be perfect cleanliness of the patient's person, especially the buttocks and genitals, for even in hospital wards one too frequently finds these parts imperfectly cleansed after defecation and urination, and it is necessary for the physician to inspect them personally to see that his orders are carried out.

While the dangerous nature of the stools is appreciated by all, the fact, that at certain stages of the disease the urine contains immense numbers of typhoid bacilli, is overlooked. Petruschky estimated the number of bacilli per cubic centimeter in three cases and found them 20,000, 5,000,000 and 172,000,000 respectively. There is greater danger of contamination of the food, etc. from the urine than from the feces.

Diet.—In the management of typhoid fever the diet presents the greatest problems, for, not only must we consider the food from the standpoint of its chemical composition, but also its influence on the local lesion and its remote effect, as well as whether it is suited to the individual case. Probably no part of the treatment of typhoid fever is considered by the majority of the profession so definitely settled as the question of food. In no other infectious disease is the diet so restricted and routine. In no other ulcerated condition of the bowels is there so great a fear as to the effect of the use of a variety of food and of adequate alimentation. This fear is largely theoretical and based upon the old conception of the nature of typhoid fever.

In no other disease do we disregard to the same extent dietetic principles and fail to adapt our food to the individual needs of the case, remaining blind to symptoms which are referable to too restricted diet, but which are usually ascribed to intestinal lesions or to giving other food than milk. The diet should be (*a*) liquid, (*b*) easily digested, (*c*) easily absorbed, (*d*) the unabsorbed portions or residue by the time it reaches the ileum should not contain any solid particles, (*e*) the food itself or its residue should not too readily undergo putrefactive or fermentative changes, (*f*) it should contain all the ingredients necessary in normal relative proportions, (*g*) it should be relished by the patient, or, at least, should not cause disgust or nausea.

Milk is considered the orthodox food, and one is considered a dietetic heretic, if, in typhoid fever, its all-sufficient power is questioned and any other suggested; nevertheless, it is necessary to consider whether milk meets, as we have been led to believe, all the requirements of an ideal and sufficient food in typhoid fever.

Although milk is taken as a liquid, as soon as it enters the stomach it is coagulated into masses of varying size and degrees of hardness. While these masses of curdled milk are readily broken up and digested in the normal stomach and small intestine, in typhoid fever, perfect disintegration of the masses occurs with difficulty, and as the feedings occur at short intervals there is not sufficient time for digestion to be completed; as a result the curds frequently reach the ileum in an irritating and dangerous condition. If anyone doubts this tendency he has only to inspect the stools of typhoid fever patients to see the frequency with which they contain hard masses. Physicians too rarely make it a routine practice to critically examine the stools to note the condition of digestion—frequently they do not even inquire concerning their nature, but are interested only in their number.

I can confirm the statement that under an exclusive milk diet of 60 to 70 ounces a day, the stools are larger and contain more undigested food than with a mixed liquid or semi-liquid diet containing the same amount of proteids, carbohydrates and fats. The modification of milk by dilution or by the addition of lime water lessens to a slight degree the above tendency. When milk is not perfectly digested it furnishes a good culture medium for the intestinal flora, with autointoxication from the products of putrefaction and fermentation.

In the treatment of other acute infectious diseases of the intestinal canal, experience has shown the necessity of withdrawing milk from the dietary for a longer or shorter time. In these diseases we recognize the fact that putrefactive and fermentative changes in the intestinal contents can increase the inflammatory condition of the bowels and cause systemic intoxication. In typhoid fever these secondary effects may be induced by the intestinal contents late in the disease, entirely independent of the histological changes caused by the typhoid bacillus.

Many patients cannot take milk at all as it causes epigastric heaviness, pain, pyrosis, eructation and abdominal distention (tympanites). In giving milk in other diseases the rule is to begin with a small amount and gradually increase until the patient's digestive apparatus becomes accustomed to it, so as to avoid the unpleasant symptoms mentioned. In typhoid fever, however, as soon as the diagnosis is made we immediately begin to feed entirely on milk, giving frequently during the first days as much as two or three quarts. It would be very instructive if every physician would experiment on himself and note the sensations following the taking of two or three pints of milk a day. The uncomfortable distention of the abdomen with its annoying and noisy accompaniment would soon impress upon

him the need of caution in giving to a patient with acute intestinal catarrh this amount of milk.

The most important requisite for a food in any exhausting disease, is that it should contain all the ingredients necessary for nutrition in normal relative proportions. In health a man needs 3,000 calories, which are supplied by 100 to 125 grams of proteids, 400 to 500 grams of carbohydrates, and 50 to 100 grams of fat; or, if estimated in relation to nitrogen and carbon, he should have proteids enough to give 17.5 grams of nitrogen and non-proteids sufficient to give 270 grams of carbon.

The ideal foodstuff should have the different ingredients in the following proportion: proteids 12, carbohydrates 50 and fats 5. In milk these proportions are: proteids 12, carbohydrates 20 and fat 18. The deficiency in carbohydrates and the relatively higher percentage of fat, causes milk to be inadequate for an adult when used alone.

On the basis that the diet should contain 110 grams of proteid to give 17.5 grams of nitrogen and non-proteids to give 270 grams of carbon, Munk has estimated that on an exclusive milk diet, six pints would be necessary to give the necessary proteids, and eight pints for the non-proteids, which is a greater quantity than most patients can take and digest.

If the milk given does not yield the necessary amount of nutritive material, then there will result a condition of partial starvation, in which the proteids of the body will be called on to make up the deficiency, and from this cause alone there will be a progressive loss of weight and strength.

In typhoid fever there is great proteid loss which cannot be equalized by the proteids of the diet although it may contain the 110 to 125 grams of proteid. It is important to shield the proteids of the body from the destructive process as far as possible, by the administration of carbohydrates and other energy-sustaining foods.

Recovery in all infectious diseases depends upon the resisting power of the patient. In typhoid fever, where we have no specific against the bacillus or its toxins, our only hope is to sustain the strength and nutrition and to preserve to the highest this power of resistance. If, during a long period of typhoid fever, the patient is kept on an insufficient diet, the resistance will be lowered and the bacilli will regain the ascendency so that we will have a recrudescence of the fever or a true relapse. I am thoroughly convinced that many of our cases of prolonged fever attended with marked physical exhaustion and cardiac weakness, are not due to the typhoid bacillus or its toxins alone, but to the lack, not of food, but of nourishment; for, under the exclusive milk diet of 60 to 70 ounces a day, our patients are overfed but undernourished.

The trouble is that as soon as we make the diagnosis of typhoid fever, we take counsel of our fears in relation to the diet and do not use the same therapeutic judgment as in other diseases. Since giving a diet richer in carbohydrates and albuminoids I have not seen the same weakness and emaciation following the first two weeks.

Professor Delafield has lately called attention to a condition named by him "post-typhoid sepsis" and characterized by fever and profound weakness which rapidly improves when the patient is given solid food and is also taken out of bed. A number of years ago my attention was called to these cases both in hospital and private practice, and while I have never been able to convince myself that the majority of them were due to a distinct sepsis, I have always considered that the symptoms were dependent upon a condition of partial starvation complicating an infectious disease of long duration.

Professor Wright and Lieutenant Knapp of the Army Medical School of Great Britain, have investigated the cause of thrombosis in typhoid fever, and have found that the coagulability of the blood is decreased during the early days of fever, but that it is increased beyond the normal during the later weeks and during convalescence. The increased coagulability they found was dependent upon an increase in the amount of lime salts in the blood, which increase is due to the calcium oxide derived from the cow's milk which contains one part in 600 as compared with one part in 800 in lime water. If this contention is true, then not only is an exclusive milk diet predisposing to thrombosis, but the liability thereto is still further increased by the use of lime water which is so commonly employed to dilute it. To overcome this tendency to an excess of calcium oxide in the blood, they suggest partial decalcification of cow's milk by adding citrate of soda (grains 20 to 40 to the pint).

The profession have, I think, adopted the rigid and restricted milk diet mainly because of its use in large hospitals. In institutions where great numbers of cases are treated, a routine diet is necessarily the best, as it guards against the giving of injurious articles by friends, and it is impossible to consider the individual likes and dislikes to the same extent as in private practice. In fact, the majority of our hospital patients do not have such fastidious tastes and such fickle digestive tracts as those in the higher walks of life; their usual diet is of necessity monotonous and variety in sickness is not so essential. But, even in these cases, I am positive that relapses would be less frequent, convalescence not so protracted, and the death-rate from complications lower, if a more varied diet were used. I do not mean that I would exclude milk from the dietary, nor do I advocate indiscriminate feeding. Indeed, one who uses a variety of food must exercise greater tact and judgment than when milk only is given, and unless he is willing and able to adapt the diet to the individual case and is also competent to give definite instructions for the making of the different preparations ordered, it will be safer for him to adhere to the exclusive milk diet.

I have one rigid rule in the giving of different foods, viz., that nothing is to be given to the pa-

tient during the early weeks of the fever that has not been or that cannot be passed through a fine wire sieve. In order to give variety to the diet and to supply the necessary nutritive elements the following preparations may be selected:

Drinks.—Pure water or mineral water from which the excess of CO_2 has been allowed to escape may be given ad libitum. It is not merely necessary that water be ordered, but care must be taken that it be given in large quantities. If possible the same type of water should be given as the patient is accustomed to, as frequently another type (hard, soft, etc.) will give the patient gastric distress and may cause diarrhea. To make the water more palatable it may be acidulated with dilute hydrochloric acid and occasionally with lemon or orange juice, or, a small amount of red or white wine may be added, although it is generally better to give it pure.

Milk.—Under the mixed diet it is rarely necessary or wise to give more than two pints a day, and the feedings should be separated by the giving of other foods. It is well to flavor the milk with coffee, cocoa or tea, or, if the patient has been accustomed to take either coffee or cocoa in the morning and desires it, it may be allowed. Putting milk in a shaker with a lump of ice and thoroughly aerating it makes it more palatable and digestible. Other milk products as koumiss, junket, etc., may be used to give variety. In order to increase the carbohydrate contents of the milk there may be added some stale bread which has been grated and passed through a fine sieve, or, instead of the bread, some of the farinaceous baby-foods.

Carbohydrates.—These may be given as mucilaginous soups made of oatmeal, rice, wheat, barley, tapioca or sago, either alone or mixed with bouillon. It has been claimed that the carbohydrates in the above forms tend to undergo fermentative changes in the intestines and that their digestion is especially difficult in typhoid fever. This objection is largely theoretical. Experience has proven that they are easily digested. When combined with milk and eggs, in the form of puddings, etc., they do cause flatulency.

Proteids.—Concentrated proteid nourishment must be given with great caution during the febrile stage. Usually that contained in the milk is sufficient. Egg when combined with milk is difficult of digestion. Egg-water, made according to the formula of Professor Osler (thoroughly shaken with ice, strained and flavored with lemon, sherry or brandy) may be given as a refreshing drink between the heartier articles of food. Yolk of egg stirred in bouillon or cereal soup should be given only after the fever has subsided and digestion has improved. The use of somatose, tropon, plasmon, etc., has been advocated, but personally I have had very little experience with their use in typhoid fever, as I prefer to give those preparations with which I am most familiar.

Gelatine.—The value of gelatine as an article of diet in typhoid fever has been underestimated. While it cannot replace the proteids it has the power to lessen nitrogenous waste and is more efficacious than either fats or carbohydrates in protecting the proteids of the body and so conserving both nutrition and energy. It is valuable for adding relish to the food with which it is combined and can be given as calf's foot jelly or by adding it to soup or broths. An especially grateful preparation is a cold jellied bouillon made by obtaining the gelatine from the bones and connective tissue of soup stock. I generally suggest that this be prepared from a shin bone of beef and a knuckle of veal. In addition to its value as a food product, gelatine is indicated in the later stages of the disease when there is danger or tendency to hemorrhage. Care must be taken, however, not to give it in excessive amounts as it has a tendency to increase the diarrhea and sometimes causes tympanites. When hemorrhage occurs and there is a rapid discharge of blood from the bowels, I have found that the use of a half ounce or an ounce of commercial gelatine dissolved in a pint of water and given in two to four ounce doses at frequent intervals, will very often have a marked effect in controlling the hemorrhage. I consider it more reliable than the use of ergot or the ordinary astringent preparations. In order to obtain the full nutritive value of the diet it is frequently necessary to supply the deficiency in the salivary, gastric and pancreatic secretions as well as the hydrochloric acid.

Cathartics.—The thorough removal of the undigested and unabsorbed residue from the intestinal canal is as important as the administration of food. In all other inflammatory and ulcerative diseases of the intestine this fact is well recognized and acted upon, but in typhoid fever the intestinal lesions presumed to be present have been considered a contraindication to the use of cathartics, and when certain cathartics have been given they have been used more as specific antiseptics or disinfectants than for the simple cathartic effect.

When there is ulceration of the ileum there is a tendency to retention of fecal matter above the site of the ulcers and there may be marked accumulation although the patient is having frequent small diarrheal discharges. This tendency to acumulation is increased by paralysis of the gut, with or without peritoneal involvement. I cannot insist too strongly upon the importance of thorough emptying of the intestines, as it is a frequent experience in both hospital and consultation practice to see patients with persistent diarrhea, tympanites, high temperature and profound toxemia, due to large fecal accumulations of partially digested food. These accumulations may occur although the routine daily enema has been given, but more frequently it has been omitted on account of the diarrhea.

The requisites of a cathartic for typhoid fever are (*a*) that it should thoroughly cleanse the small and large intestine, (*b*) that it should not cause markedly increased peristalsis or griping

(*c*) that it should not derange the digestion, and (*d*) that it should not produce any effect beyond that of a simple cathartic action. Only two classes of cathartics meet these requirements (*a*) the salines and (*b*) castor oil (in infants, sweet oil). Among the salines there is a wide range for selection, the phosphate of soda and the sulphate of magnesia being those most generally used, or, where the patient has been accustomed to use one of the saline aperient waters, this may be given, as the necessary dose is more readily determined.

My preference is for small doses of castor oil, just sufficient to cause one or two soft movements a day. I usually administer it in elastic capsules giving one or two drams at night and also in the morning if needed. If there is a tendency to griping the addition of three to five drops of chloroform to the capsules usually prevents it. When an intestinal disinfectant is needed five grains of salol may be added to each capsule. The form of cathartic and the dose should be that best suited to the individual case. It should be given throughout the disease for cleansing purposes only.

Intestinal Antiseptics.—Before the specific cause of typhoid fever was known, various forms of treatment, based on the intestinal lesions and considered more or less specific, were advocated. The two most important plans were the eliminative, by the use of purgative medicines, etc., and the antiseptic or germicidal, and frequently these two were combined in one as by the use of calomel.

Nearly every drug with antiseptic or germicidal action has at some time been used as a specific against the supposed infectious condition in the intestine. If, in addition to its antiseptic properties, the drug was also antipyretic, its advocates were the more numerous. After a more or less ephemeral reputation, most of these drugs have fallen into disuse. Those which have had a more lasting use are salol, bismuth, the salicylates and beta-naphthol.

Although typhoid fever is a bacillemia and it is futile to attempt to combat the disease by the use of intestinal antiseptics, still, changes in the intestinal contents and bacteria and secondary changes in the intestine itself may call for specific antiseptic treatment. Putrefaction or fermentation of the intestinal contents may induce inflammatory changes in the bowels, or, through systemic intoxication, cause an increased susceptibility to reinfection by the typhoid bacillus, giving a recrudescence or relapse. Alessi, in the Hygienic Institute at Rome, found that rabbits, guinea-pigs and rats lost their natural immunity to typhoid fever when poisoned by an atmosphere vitiated by emanations from a privy-vault or collections of their own excreta.

When systemic intoxication occurs through absorption from the intestine, the susceptibility of the patient to reinfection is greatly increased and many cases of relapse have been traced to this cause. In combating putrefactive changes, personally I prefer salol, either given alone or dissolved in castor oil as mentioned above. If salol is not tolerated then the salicylate of bismuth (5 to 10 grains) may be used. Recently a new intestinal antiseptic, acetozone (benzoyl-acetyl-peroxide) had appeared and even specific action is claimed for it. When administered during the entire cause of the fever it is claimed (*a*) that the length of the disease is lessened, (*b*) the stools and also hospital wards that contain a large number of typhoid fever patients lose their characteristic odor, (*c*) diarrhea and tympanites are checked, (*d*) stupor and delirium are very much less, (*e*) the temperature runs a lower course and hyperpyrexia but rarely occurs. It is said that relapses are infrequent when its use is continued until convalescence is established, also that it does not affect deleteriously the heart, lungs or kidneys. Whether these claims will be substantiated, time alone will tell. Personal use in a limited number of cases who could take the drug in the quantities and for the length of time advised has not given such encouraging results.

With attention to the diet and with thorough cleansing of the bowels the use of the different intestinal antiseptics has less place in typhoid therapy than heretofore.

Management of the Temperature.—The control of the temperature has always been considered one of the prime objects in the treatment of typhoid fever. The fact is often lost sight of that it is not the degree of fever that should guide us in the administration of antipyretic treatment, but rather the associated symptoms showing the action of the toxins on the nervous system and metabolism, *i.e.*, stupor, delirium, cardiac, respiratory and gastro-intestinal disturbance, emaciation and especially the condition of the urine. Any treatment that merely reduces the temperature but does not improve these associated conditions is useless or harmful.

Hydrotherapy is the method most commonly used to reduce the temperature and by many it is considered the only means that is justiable. In hospitals and frequently in private practice, antipyretic baths are ordered whenever the temperature rises above 102.5° F.

It is unnecessary to describe the different varieties of baths and their administration. It is only necessary to call attention to the fact that their use is twofold—first the extraction of heat, and second the toning up of the nervous system. In order to obtain the first-mentioned effect it is necessary for the surface circulation to be active. If cold is applied and there is no reaction of the surface circulation there will be diminished heat elimination through the contraction of the capillaries and also increased metabolism. It is therefore necessary, by brisk rubbing, to ensure an active capillary circulation. When this is obtained then the full tub-bath, the mitten bath, the bed bath, etc. will give satisfactory results according to the individual susceptibility of the patient and the degree of fever.

The routine practice of tubbing the patient

whenever the temperature reaches 102° to 103° F. is rapidly falling into disuse and the need of rest and of conserving the energy of the patient is being more and more considered in relation to the bath treatment. Rarely is it necessary to give a patient more than three, or at most four or five baths a day. The individual susceptibility should always be tested by having the first bath at a temperature of about 90°. In many cases where the cold bath of 70° to 75° F. causes profound shock, better results can be obtained by the warm bath, which, according to the plan of Liebermeister, may be gradually cooled.

At the present time the use of the coal-tar antipyretics and quinine is deprecated by most authors in the treatment of typhoid fever. The antagonism to these antipyretic drugs is largely the result of excessive use when the antipyrine group was first introduced into medicine. When given in large doses so as to depress the temperature to normal or below, they undoubtedly do great harm, but when combined with the bath treatment they have the power of controlling the temperature and at the same time improving the general condition of the patient. Phenacetine given in small doses does not cause dangerous depression of the heart, but on the other hand has the power to reduce temperature through its action upon the heat-regulating nervous mechanism so that the point at which the temperature is maintained is a lower one. The drug counteracts the effect of the toxins on the heat-regulating apparatus, and as a result, of even the temporary lowering of the temperature the proteid waste is limited and nutrition conserved. Acetanilid is preferred by many to phenacetin but on account of its tendency to cause cyanosis in some individuals it should be used with caution, unless the patient's tolerance is known.

Quinine has always held its reputation among clinicians as an antipyretic. Recent investigations have shown that its action is not upon the heat-regulating apparatus, as is the case in the coal-tar series, but rather that it has the distinct power of controlling nitrogenous metabolism, so that the old name of "fever food" is still applicable to the drug. When given for its antipyretic effect the full dose (15 grains) should be given at once, or 5-grain doses repeated every fifteen minutes until the full dose is taken. The heroic doses of 30 to 40 grains are rarely necessary or justifiable, although at times cases do occur in which this amount must be given in order to positively control the temperature. After the initial dose of fifteen grains has been given the antipyretic action may be continued by giving 5-grain doses at three or four hour intervals. Quinine is especially indicated as an antipyretic in the so-called cases of posttyphoidal sepsis, where the temperature is due, not so much to the acute typhoid infection as to a septic infection from the ulcerated intestinal wall.

Cardiac Stimulants.—Progressive cardiac weakness is one of the most alarming features of typhoid fever. Early in the disease physical examination shows increase in the area of cardiac dulness, the apex beat becomes indistinct, there is diminution in the intensity of the first sound with relative accentuation of the aortic second sound and absolute accentuation of the pulmonic second sound. These evidences of myocardial weakness usually increase in intensity up to the third week, or, if convalescence is delayed, may go beyond this and be the determining cause of death. Although myocardial weakness is present the pulse is usually slower than in other febrile conditions and the pulse curve will not be found to run parallel with that of the temperature.

The changes in the myocardium and in the pulse during the early stage of the disease are undoubtedly due to the specific action of a toxin on the nervo-muscular mechanism of the circulatory system. In addition to these cardiac changes we frequently meet instances of sudden collapse designated by the term "acute cardiac failure." Romberg has lately shown that in other infectious diseases than typhoid fever this acute cardiac weakness is due to the effect of a toxin upon the vasomotor system.

The conservation of cardiac energy has always been one of the most important objects in the treatment. During the early period of the disease our efforts are directed to the free elimination of the toxins and the fortification of the nervous system against their action. The free elimination of the toxins is best secured through the kidneys by giving the necessary quantity of pure water. When the function of the kidneys is impaired the use of diuretin or agurin not only increases their eliminative power, but at the same time acts as a cardiac and cerebral stimulant.

Against the action of the toxin on the heart and nervous system, two agents have been especially advocated, viz., strychnine and alcohol. At the present time strychnine is the more commonly used and I cannot too strongly dissent from the present plan of giving strychnine in heroic doses as soon as typhoid fever is diagnosed. It is not unusual to find, both in hospital and private practice, patients who have gone through the first week or ten days of typhoid fever so freely drugged with strychnine that their reflexes are exaggerated. In these cases much of the restlessness and distress, supposed to be due to the disease, is actually caused by medication. Patients who are early stimulated to the full physiological limit by strychnine make a slower convalescence and are more prone to vasomotor disturbance and nervous depression during this stage. Strychnine should be reserved until the condition of the reflexes, both cardiac and spinal, show that the disease has begun to affect nervous centers and its dose should then be regulated so as just to meet the indications.

Among older clinicians alcohol has always been considered a sheet-anchor in the treatment of this disease, but in recent years its value as a cardiac stimulant has been doubted and pharmaco-

logical experiments and data have been brought forward to strengthen this contention.

Although alcohol in the animal and in the healthy individual may show no action upon the circulatory system beyond a reflex one, still in diseased conditions, especially the infectious fevers, it has a different action. We are all familiar with the fact that large doses can be given to a febrile case without symptoms of intoxication being induced or the odor of alcohol appearing on the breath, and that under its use the nervous system is quieted and cardiac action slowed, while the respirations are fuller and deeper. Whether in health alcohol acts as a food, is not germain to this discussion—certainly in typhoid fever alcohol acts both as a stimulant and a food, and when the diet is deficient, as when a milk diet alone is given, nutrition is improved and emaciation retarded.

I do not advise the giving of large quantities of alcohol throughout the entire course of the disease, but where the patient is steadlly wasting and where there is evidence of progressive cardiac weakness, alcohol should be used to combat this condition. If the beneficial effects are obtained with a few initial doses its use should be continued; if, on the other hand, the patient becomes more restless and the pulse quicker, then its use is contraindicated. In young persons especially its early effects should be watched.

Another drug that is abused in the treatment of this disease is nitroglycerin. Frequently in acute collapse, or when cardiac weakness has reached the point of causing the pulse to become dicrotic, this drug is given at frequent intervals with the idea of diminishing the work of the heart. In acute cardiac collapse Romberg has shown that there is already vasomotor paralysis and that the failure is more vascular than cardiac and nitroglycerin cannot under these circumstances relieve the condition. In the later stages of the disease when the pulse is dicrotic, the dicrotism is due to the relaxed condition of the arteries, and the giving of nitroglycerin does not relieve the heart, but, on the other hand, destroys the normal control of the circulatory system. Nitroglycerin should only be given when arterial tension is relatively too high for the cardiac power and then only to carry the patient over the immediate danger. It is not a drug that should be given continuously for any length of time.

I have already exceeded the time allotted for this portion of the symposium, and it is impossible to consider in the limit set for this paper the treatment of all the conditions and complications that may arise during the course of typhoid fever. I have tried merely to emphasize that the treatment of typhoid fever, whether dietetic, medicinal or hydrotherapic, is apt to be too routine and to show too little individualization. Many fail to meet the most positive therapeutic indications because the case is one of typhoid fever and they fear to depart from the orthodox methods of treatment. There should be no hard and fast treatment of typhoid fever. The therapeutic problems presented by each case should be met with the same medical judgment that is used in the treatment of other diseases.

THOUGHTS ON CHLORINE AND AN ANTISEPTIC TECHNIC.*

BY DOUGLAS H. STEWART, M.D.,
OF NEW YORK.

THE preparation of this simple preliminary paper has been most difficult. A bacteriologist, an obstetrician and three surgeons have asked me to meet the following tests:

First.—It makes no impression if you never get a culture from your hands. Show me what you can do with anthrax.

Second.—Results with anthrax are valueless. Few surgeons have met it, none have contaminated wounds with it, and only hand results appeal to us.

Third.—Do not give us any results with any chemical. The profession has gone chemically mad.

Fourth.—Your technic does not make the hands dry enough.

Fifth.—It makes the hands too dry.

These opinions, given by men of reputation, ensure failure for the writer unless all that he says is verified by many observers. Let us consider one germicide, chlorine; one standard, 1-1,000 bichloride: one test germ, anthrax, and one medium, nutrient agar. Cultures spoken of as positive have grown, as negative have not grown. Many men have found that fresh aq. chlori. (.4 per cent.) would destroy anthrax in a day. Geppert says anthrax spores may be active after an immersion of twenty-five hours in 1-100 bichloride. I have taken twenty-five successive positives after a ten-minute exposure to 1-1,000 bichloride. After one-per-cent. lysol I have never failed to obtain positives, yet this soap is a powerful antizymotic and arrested the action of yeast and pepsin. One technic, glycerin and calx chlorate, fizzed but did not explode possibly because the hands were plunged instantly into cold water. Contact was not over fifteen to twenty seconds but it blistered badly wherever it touched my skin.

The two best known chlorine solutions are the liq. sod. chlorat. of Labarraque and the liq. pot. chlorat. of Javelle (Javelle is a mill, not a man, by the way). Though the formulæ are quite different, it is doubtful if a druggist in our city is not selling both under a Javelle label.

By omitting water from the Labarraque we obtain the well-known technic of washing soda and calx. This with anthrax gave six positives out of six trials. It worked well against molds, gave quite as good results and did not attack the hands so much when one third (by weight) of the carbonat. potas. was substituted for the carbonat. sodæ. By modification this became calx, table

* Read before the West End Medical Society, Nov. 7, 1903.

salt, carbonat. potas. and aq. ammonia—one teaspoonful of the salts and four of the aq. It is irritating in proportion to the temperature of the quart of water in which it is dissolved.

During experimentation Javelle water was changed to one teaspoonful of sulphuric acid, of calx and of table salt. Ultimately this solution was divided into two of a pint each with the acid and lime in different basins. Just here several physicians expressed fears of the portability of the vitriol. Therefore another chlorine technic was worked out with acetic acid.

After testing many soaps the ordinary brown laundry variety seemed always sterile, but sterility of the hands from the use of any soap I have never seen. If green soap is ever sterile, then I have been unfortunate in my specimens, since every trial has given positives. Anthrax and molds grow in it.

Should you wish to eliminate soap from your present technic the following suggestion may be of some value. Take a heaping teaspoonful of calc. chlorat., of table salt and of aq. ammoniæ, mix them in a quart of cool water, bleach and cleanse your hands therein and they will often be sterile. Give special attention to the nails with powdered pumice, stick and brush. If you cannot make them macroscopically clean put chlorinated lime under them and around their margins.

Do not put the calx on the sensitive skin. When properly performed, you should not get more than two positives out of twelve attempts, although this washing is merely preparatory. One doctor, after a long railway journey gave one single spot in a Petri dish out of twelve trials. Several others have done as well.

At the Polyclinic Hospital the following method has been in use for the past fortnight: five minutes mechanical—pumice, brush, hot water, green soap and wooden nail cleaners. Five minutes chemical.—Two heaping teaspoonfuls of fresh calx chlorat. and one teaspoonful of U. S. P. acetic acid to the pint of sterile water. The germicidal power of this mixture fully equals 1-1,000 bichloride. On its best field of operation, *i.e.*, glassware, bichloride gave 56 positives and 34 negatives out of 90 tests while the solution gave 64 positives and 98 negatives out of 162. Tap-water was the solvent and anthrax the standard, while the conditions were kept as nearly identical as possible. On the hands my results with bichloride show so poorly that I prefer to make more experiments before pronouncing on its value. Septic wounds do surprisingly well with the chlorinated solution diluted with water (1 to 3 or 1 to 6) and applied on compresses. A weaker solution with prolonged contact is very effective.

An obstetrician should have an antiseptic hand, because of the very temporary duration of asepsis. A pair of rubber gloves were boiled hard for 15 minutes, laid on a sterile plate and exposed to ordinary conditions. Two tests were made every three minutes. The second trial of one glove, *i.e.*, at the end of three minutes, both tests were positive. The other glove took at twenty-one and twenty-four minutes. My left hand rendered antiseptic was absolutely negative up to 36 minutes when the test ceased.

One would think that a hand once antiseptic could be kept in that condition indefinitely. Out of eight attempts at complete hand-antisepsis for twenty-four hours three gave positives and five negatives. Of six attempts at five-hour antisepsis two gave positives and four negatives. The surgeon has a most valuable expedient in using one knife for the skin and another for the deeper parts. The obstetrician must get at his work through a contaminated ring. He deals with a septic finger, a septic vulva and an aseptic vagina—broadly speaking. No matter how sterile his glove the introduction of one finger will carry the germs of the vulva into the ostium vaginæ and may contaminate the whole tract. Obviously his only method should be to sterilize the vulva first, and then leave the vagina alone.

I know of no methods in general use which will sterilize a vulva. All fail when tried at the bar of the culture media. After sterilizing three different vulvæ I explained to Dr. Brodhead the *modus operandi*—he has experimented further and has kindly consented to discuss this part of the subject.

A pleasant surprise is the thermometric reading when the full technic for patient and attendant has been carried out. Recently my advice to pregnant women is to daily wash the mons veneris and all about the private parts with water 2 quarts, a heaping teaspoonful of calx, of salt and a half teaspoonful of pot. carb. Let it dry on the skin. The proportions should be reduced if any irritation is complained of, but as yet there have been no complaints save only from the heat of the water—this is better mixed hot and then allowed to cool. Without being too positive with but three vulvæ, one was sterile after the second washing, one after the sixth and the third was confined too soon to give any line. The difference in the cultures before washing and after was marked in every instance. The growths were slowed down. Three contrast (check) cases reached a maximum temperature of 100° F. during the puerperium. The three mentioned reached 99⅕° F. in one instance and 99° F. in the other two.

It may seem absurd, but I wish to emphasize that an antiseptic hand cannot be obtained by wiggling the fingers in any solution. The question of contamination must be answered by the culture process. P. D. Co. and the Board of Health put up little Löffler serum tubes and with care two culture strokes may be made in each one. A before and after test, if you wish; side by side. These can be incubated in the inside vest pocket. The P. D. tubes have rubber tips but those of the Board of Health should be sealed with wax. While the method is crude it gives fair results and may be the means of converting many from their pet technic. If any one should come

to the conclusion that the suggestions of the writer are worthy of trial then, to obtain good results fresh calc. chlorat. must be secured and it must be kept in small air tight glass or metal packages which are only opened when in actual use.

Finally, it is a well-known and commonly disregarded fact that all chlorine solutions depreciate very rapidly. In my experiments an active germicide effect of two-minute exposure was diminished to a five-minute one in a half hour and an eighteen-minute one in a day. After that it remained stationary for a time.

Note.—Dr. Brodhead reports only 5 positives out of 74 attempts at sterilization of the vulva.

121 West Eighty-eighth Street.

EXCISION OF THE FRENUM PREPUTII FOLLOWING LACERATION DURING A SUSPICIOUS INTERCOURSE.

BY CHARLES C. MILLER, M.D.,

OF CHICAGO.

IN this article I propose to recommend, as an addition to circumcision, a thorough removal of the remains of the frenum preputii, when this part has been distinctly lacerated or torn across during an intercourse with a woman who is likely to have been syphilitic.

By this operation, practised within twenty-four or forty-eight hours after the occurrence of the laceration and infection, it is hoped that infection

Fig. 1.

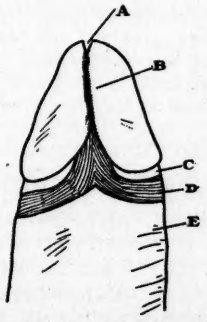

Fig. 1 shows penis after skin of prepuce has been cut away and mucous membrane trimmed. A represents meatus; B, remains of torn frenum; C, mucous membrane; D, raw surface between skin and mucous membrane; E, skin of penis.

with syphilis, where it has occurred, will be prevented from becoming constitutional.

If only one per cent. of cases are saved from syphilitic infection, by this simple procedure, we will have rendered that individual saved from infection an inestimable service, and, at the same time, no harm has been done to any upon whom the operation has been practised.

Note.—The illustrations are diagrammatic and all show line of frenum as longer than it really is in normal state.

Syphilis is an exceedingly common disease, and a very large per cent. of women submitting to illicit intercourse are syphilitic. In view of this, a laceration upon an unprotected penis during an illicit intercourse will in many cases subsequently mark the site of a chancre.

A great majority of patients contracting syphilis are never cured of the disease. This is usually

Fig. 2.

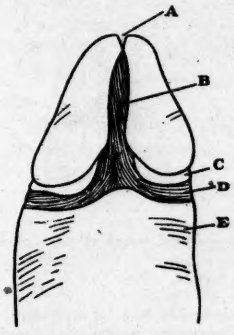

Fig. 2 shows groove made by scissors in excising remains of frenum. This is to be closed by a continuous suture of fine catgut before the sutures used in approximating skin and mucosa are placed. Bleeding of the parts will be controlled by the close continuous suture.

due to indisposition or inability of the patient to submit to prolonged skilful treatment.

Any measure which gives promise of preventing the development of syphilis, deserves a faithful trial until proved useless.

The course of syphilis makes it reasonable to suppose that constitutional infection may not occur for a number of hours at least after inoculation of the virus upon a raw surface.

Syphilitic infection is supposed to always occur through a break in the epithelial covering of the body. The frenum is a frequent site for the occurrence of abrasions or lacerations, as the result of violence during intercourse. Where this delicate bridle of tissue is completely torn across, atrophy will occur subsequently. As the part will disappear and functionate no longer, we are justified in hastening this somewhat by operation, if thereby we can save any of these cases from developing syphilis.

It is a disputed question, whether the mere presence of a redundant prepuce is sufficient ground for recommending its removal. Where the possessor of a redundant prepuce is exposing himself to infection by illicit intercourse, we are justified in advising the operation as a prophylactic measure, as by its removal we minimize the dangers of subsequent venereal infection.

If a patient consult for advice regarding a lacerated frenum, and he possesses a redundant prepuce, we are justified in advising circumcision, where the intercourse has been with some public woman, and as a further step to prevent the development of a possible chancre at the site of the frenum, it should be thoroughly excised during

the operation with a certain amount of the tissues upon each side and below as well.

In these cases the usual technic of amputating the prepuce will be followed. The skin is cut away along the line of the corona. The mucosa is now trimmed and hemostasis completed.

The cautery is to be used over the raw surface of the lacerated frenum in order that any surface

Fig.

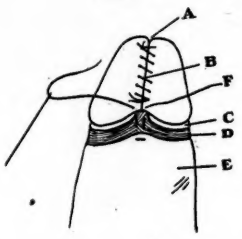

Fig. 3 shows groove formed by the excision of remains of frenum closed by continuous suture. F shows suture in place, which when tied will bring skin in contact with glans at former site of frenum. When this is tied operation concluded by approximating skin and mucosa around penis by a series of interrupted sutures.

infection be overcome before beginning the operation.

The frenum is to be extirpated with small curved scissors. This may be facilitated by drawing it out with tissue forceps. Such precautions are to be taken as are necessary to prevent contact of the lacerated surface of the frenum, with any raw surface to prevent any possible reinfection. The instruments used in this step of the operation are to be discarded until thoroughly sterilized.

Fig. 4.

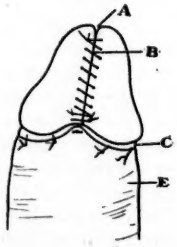

Fig. 4.—Operation complete. Groove left by excision of remains of frenum, closed by continuous suture and the mucosa and skin of penis approximated by interrupted suture.

As a result of our excision, in place of the remains of the lacerated frenum, we will have a groove about an eighth of an inch deep and somewhat wider. Beginning now near the meatus a continuous catgut suture is to be used closely approximate to the edges of the groove. A stitch is now placed so as to draw the skin forward in contact with the glans in the median line, and then the operation of circumcision completed in the usual manner.

Where the prepuce is not inflamed, the operation can be done with local anesthesia from cocaine. By carrying the needle along under the frenum, we can render the parts insensitive so that the frenum can be excised without pain.

A free oozing will commence as soon as we cut away the frenum. This will be controlled by the close continuous suture. If a needle with a cutting edge be used for the suturing through the glans, we will have a temporary hemorrhage from each needle puncture. No attention need be given to this as it will check of its own accord before the operation has been completed.

This procedure adds from three to five minutes to the length of time required for a circumcision, but it is easily performed without pain to the patient, and is not followed by any unpleasant complications or sequelæ.

The groove in the glans unites even more rapidly than skin and mucosa. Where plain number one catgut is used as a suture material, no further attention is required from this part of the operation, it coming away in a few days leaving the parts healed.

During a period of a little over two years, I have extirpated the frenum in this way five times. In only one case have there been any subsequent complications. In this, the first case, the tissues were cut away very sparingly forty-eight hours after the infection of the laceration. A portion was left and a chancroidal infection developed. This was healed without much difficulty with a perfectly satisfactory final result. It illustrated the need of a careful and free excision of the tissues. None of the other cases have developed a venereal sore at the site of the operation, nor symptoms of syphilis subsequently.

If the operation prevents one per cent. of cases from developing a constitutional syphilis, it will prove a valuable addition to the operation of circumcision in those cases.

CHICKENPOX CONCURRENT WITH SMALLPOX.

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COMPARATIVELY little has been written upon this subject, notwithstanding the fact that within the last three years varicella and variola have had unusual opportunities to present themselves simultaneously, owing to the wide distribution of variola.

It is conceded that varicella and variola are distinct diseases, yet their points of resemblance make their association interesting and worth study. Among the few who still affirm the unity of the two diseases are men of reputation, which fact, in connection with our ignorance of the specific cause of chickenpox, at least, and the difficulties of differential diagnosis occasionally met with, lends additional interest to the subject.

The views of the dissenters have been fully quoted by J. S. Schamberg and need not be recon-

sidered. It is not my purpose to argue this matter, but to proceed upon the supposition that the identity of the disease with which I dealt is doubtful, and to attempt to justify a diagnosis of chickenpox in my cases, at a time when smallpox was rife, and its importance deeply impressed upon the public mind.

The prevalence of smallpox in Houghton County for nearly three years, and of chickenpox during a part of that time, has furnished an unusual opportunity for a study of these diseases in concurrence. Variola prevailed mainly in Calumet, including the contiguous villages Laurium and Red Jacket, and in Houghton and Hancock and their environs, and varicella mainly in Lake Linden, distant five miles from Calumet and twelve from Houghton and Hancock. Free communication between the various towns existed at all times, however, and abundant opportunity was afforded for carrying disease from place to place.

I have not been able to ascertain the total number of smallpox cases in the recent epidemic, but an idea of its prevalence may be had from the figures furnished me by Mr. Robert Wetzel, health officer of the Calumet district. There were reported between the dates May 31, 1900, and December 3, 1902, 106 cases. The remainder of the county may be supposed, without great error, to bring the total to four or five hundred cases. Fully 75 per cent. of those in Calumet were adults. The epidemic was a mild one, not over four deaths resulting, a mortality of about one per cent. What percentage of cases were confluent I have not been able to find out. It may be said that the cases presented, as a rule, the classical picture of a mild type of variola.

In Lake Linden and South Lake Linden, there were probably not more than a dozen cases of smallpox throughout the entire epidemic. In this district, however, varicella was especially prevalent from the fall of 1901 to the following spring, fully 100 cases occurring in my practice alone. At the time of the outbreak of the varicella epidemic there were, to the best of my knowledge, no cases of variola in those two towns. A few cases appeared later, in the summer of 1902, and some had existed previous to the varicella.

On November 20, 1901, I found a case of varicella in South Lake Linden. On inquiry, I found that there had been other cases among the schoolmates and playmates of my patient; cases which no physician had been called to attend. Some of these children attended the German Catholic School in Lake Linden. This school had an attendance of 150 children from six to fourteen years old. On December 7 varicella appeared in this school and soon became widespread throughout its membership, but was restricted, in Lake Linden, to this school. In South Lake Linden, where some of the pupils lived, numerous cases developed also.

To show how closely the spread of the affection was limited, I can say that I was not called on to treat a case outside of the German School pupils or members of their families, until January 11, 1902.

Careful record was kept of 29 of the earlier cases. In each instance there were two or more children in the infected families, and in the absence of protection by previous attack, nearly all those of an easily infected age became infected. Those not yielding to infection were usually over twelve years old. One child of eight, who had had varicella at three, had it a second time.

The ages of my patients varied from nine months to fifteen years. By periods of five years the table is as follows:

Under 1 year,.....	2 cases.
From 1 to 5 years inclusive,.....	11 cases.
From 6 to 10 years inclusive,....	13 cases.
From 11 to 15 years inclusive,....	3 cases.

To sum up:

Total number of children in infected families, ...	53
Number of cases,.....	29
Protected by previous attack,.....	8
Infected notwithstanding previous attack,	1
Not yielding to infection, though not protected by previous attack,.....	16

The ages of these last were, as I have elsewhere stated, usually more than twelve years.

Thirteen of the 29 had been vaccinated within the preceding two years. Eleven of the vaccinations were said to have taken, though scars were not always found to corroborate the statements. The remaining 16 had never been vaccinated.

Regarding the vaccination of the parents of these children my data are meager. In four instances both parents had been successfully vaccinated in early life, at such an interval that the vaccination could no longer be considered protective. My impression is, that the remaining nine pairs were not vaccinated. None of the exposed adults had ever had variola, and none yielded to the varicella infection, if we exclude a girl of fifteen, my oldest patient.

In studying the incubation period, a number of points must be remembered. First: several children of the same family, attending the same school, and undergoing the same exposure, would develop the disease within a few days of each other. In such cases, the first child becoming sick cannot be supposed to have infected the others, nor can in any way, the time of incubation be definitely settled.

It is only in those cases where children too young to go out of doors, or to play indiscriminately with other children, contracted the disease from their older brothers and sisters, that the incubation period can be determined with any accuracy. In twelve such instances the period varied from eight to sixteen days, the average being between eleven and twelve days. A prodromal stage of a few days, was noted in several cases, with malaise and anorexia as symptoms. There were sometimes no symptoms of onset, the parents, attention being first drawn to lesions on

the face. In very young children fretfulness, anorexia, itching, and fever ushered in the sickness. The older children presented various combinations of the following symptoms,—headache, usually frontal, and not severe, dizziness, moderate lumbar pain, anorexia, chilliness, nausea, sore throat, and itching. Excluding the cases without symptoms, anorexia, chilliness, sore throat and itching were universal.

Objectively, fever not higher than 101.5° F. was noted, usually it did not exceed 100.5. Congestion of the pharynx fauces and palate was present in nearly all cases, and was accompanied by lesions of the mucous membrane.

The skin lesions always appeared within thirty-six hours, usually within twenty-four. There was in no case any preliminary scarlatiniform rash. The lesions were invariably discrete and the unaffected skin was not red.

As a rule they first appeared on the trunk, generally selecting the back, and soon after coming out on the chest. The back was usually more thickly covered than any other region. The forehead, temple, back of neck, postauricular region, axilla, arms and legs were also cited as localities of first appearance of lesions in a few instances. Frequently the disease was unnoticed till the lesions appeared on the face, when an examination would show that they had existed for some time on the trunk and limbs. In such cases the oldest lesions were usually found on the back. The spread of the rash was always rapid, full eruption always occurring in from twelve to twenty-four hours, and occasionally in six hours. The lesions were numerous, and widely distributed. The scalp, forehead, temples, eyelids, the lower parts of the cheeks, chin, postauricular regions, neck, back, chest, axillæ, arms, forearms, wrists, dorsal and palmar surfaces of the hands, the fingers, the abdomen, buttocks, inner surfaces of thighs, legs and feet, were attacked, and the pharynx, fauces and hard palate very frequently showed lesions, while the soft palate and tongue only occasionally presented them. The lesions of the mucous membranes were accompanied by a diffuse congestion out of all proportion to the redness circumscribing the cutaneous lesions.

Of the skin surfaces, the back, chest, scalp, and some portion of the face, usually the forehead, were involved in all cases, the back being the scene of the most numerous lesions. The arms, forearms and wrists were attacked next in frequency, then the thighs and legs. No preference was shown for flexor or extensor surfaces. The palms and back of the hands were involved in several cases, and in one instance, a finger. The feet and toes were rarely affected.

The lesions always began as small, thinly covered, red, raised papules, involving only the superficial layers of the skin. Induration was very slight or absent. There was no shotty feel. Slight hyperemia was always present, the papule being encircled by a narrow zone of congestion. The papules were usually tender on pressure. Within a few hours, the papules began to vesiculate. The vesicles were small, thin, and at first clear or pearly. Their average diameter was 1 to 2 mm. but occasionally they were larger, 2, 4 or even 5 mm. in diameter. In a case of varicella bullosa, some vesicles measured 8 mm. and over. On the second or third day, the vesicles became turbid, and at this stage, not only flattening, but very often more or less umbilication was observed. The shriveling of the vesicles now began and progressed rapidly till in four or five days, sometimes only three, from the beginning of vesiculation, crusts varying in color from yellow brown to chocolate, and surrounded by a narrow zone of congestion, were all that remained. In a number of instances it was noted that clear vesicles became turbid, brownish and shriveled within twenty-four hours. As the papules were vesiculating, fresh crops appeared, to be followed in turn by others till the disease was spent, so that, by the third or fourth day, lesions were present in all stages from papules to drying vesicles.

At the end of a week, or sometimes at the end of five days, all lesions were drying, and the crusts of the earlier ones loosening. The crusts of the last crop did not fall for from ten to fifteen days. The greatest persistence was shown by the scalp lesions. There was no scar unless scratching had been indulged in, with resulting infection. A very faint light brown stain occasionally remained, for only a short time, however. The fever did not decline with appearance of the eruption, but persisted, as a rule, till by the absence of further crops of papules and by drying of the older lesions, the disease showed that it was declining. There was in no case any secondary fever. Instead of a rise as the vesicles became turbid, there was a tendency toward a fall of temperature.

An interesting symptom, which I have not seen described, is enlargement and tenderness of the occipital glands. Of my 29 cases, these glands were affected in 16; both sides 10 times, the right alone five times, and the left alone, once.

The enlargement and tenderness began from one to three days after the onset, and persisted, in some instances for three weeks, usually however subsiding with the decline of the disease. There were no complications, sequelæ or deaths among my cases.

The description just concluded corresponds in nearly every detail with that of chickenpox. I have reported vesicles on the forearms, hands and fingers in several cases, which is not usual in chickenpox, but which by no means excludes that affection. Wanklyn (an English writer) says that the freedom of the hands and forearms in varicella, as compared with smallpox, is remarkable, but that we cannot exclude varicella if vesicles occur on the hands and feet. It is the relative distribution that is to be emphasized.

Differential diagnosis was, as a rule, easy. The more severe cases occasionally made me reserve my decision for a day, but usually attention to the following points, made the diagnosis clear: (1) Mild onset; (2) absence of preliminary rash; (3) rapid appearance of eruption; (4) failure of

temperature to decline with appearance of eruption; (5) distribution of lesions; (6) character of lesions; (7) rapid vesiculation; (8) successive crops of papules; (9) absence of secondary fever; (10) short course of disease.

I cannot speak from personal experience of the blood picture of varicella and variola, nor of the microscopical appearance of the vesicular fluid as described by Professor Courmont of Lyons.

In concluding my analysis of the epidemic described as chickenpox, I would emphasize the following points:

1. The concurrence of smallpox in no way caused the course of my cases to depart from that typical of chickenpox.

2. Vaccinated and unvaccinated children showed equal susceptibility to infection, and the course of the sickness was the same in each class. This fact excludes varioloid.

3. None of my patients had ever been exposed to smallpox or had ever had it.

4. No adults were attacked notwithstanding absence of vaccination in a majority.

5. Five of the children exposed had had chickenpox in a previous epidemic, these previous attacks conferring immunity except in one instance.

6. Smallpox and chickenpox are distinct pathological entities, and though in intimate association, neither disease influences in any way the natural history of the other.

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SPECIAL ARTICLE.

MORBID ANATOMY AND HISTOLOGY OF PULMONARY TUBERCULOSIS IN RELATION TO ITS GENERAL PATHOLOGY AND CLINICAL MANIFESTATIONS.*

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WHEN the Henry Phipps Institute for the Study, Treatment, and Prevention of Tuberculosis did me the honor to invite me to give one of this series of lectures, I felt that I had little time in which to prepare any lecture worthy of the occasion. I was just in the midst of the work of our term, and as I had to start for your shores as soon as the term ended, I knew that until I got onto the Atlantic (whose vagaries at this time of the year have to be reckoned with) I should be able to give but little time or attention to the thinking out of the details of my address.

The opportunity of visiting your great country thus presented to me was, however, so tempting and the prospect of meeting my many valued friends on this side so attractive that I determined to give you the results of some of my own work on the relation of the morbid anatomy and histology of phthisis to its general pathology and clinical manifestations. I was all the more tempted to follow this line of thought from the fact that in recent years the pessimistic views of the physician—based on the pessimistic foundation laid by the earlier pathologists—though gradually giving way before the evidence afforded by more recent research are hard to scotch and still more difficult to kill. It will, of course, be understood that the advancing and advanced lesions found in cases of pulmonary tuberculosis that had succumbed could not but prove fatal. The presence of Virchow's caseous tubercle in all its fearful and destructive simplicity seemed to leave no hope for the recovery of any patient affected; and what the pathologist found one day the physician accepted the next. It was perhaps natural that this should be the case but the evil wrought by this pessimism was incalculable and I think that most of those of you here to-night, who have given even a small amount of attention to the subject will agree with me that this view as to the incurability of tuberculosis had more influence than any other single factor with which we are at present acquainted, in interfering with the successful treatment of a disease that should, I venture to say, now be looked upon as among the most curable—when taken early enough, treated under proper conditions, and for a sufficiently long period.

If modern pathology had been responsible for nothing beyond the effect that its findings have had on our ideas concerning the course of the tuberculous processes, especially in the lung, it would have more than justified its claim to be one of the most important, if not the most important, of all the sciences ancillary to medicine.

I am here to speak as a pathologist, and it is possible, nay, even probable, that some of you may be of opinion that I claim too much for my subject; but of this I am convinced—that the more closely the pathology (including morbid anatomy and histology as read in the light of recent bacteriological discoveries) of tuberculosis is studied in the cases that come under the observation of your physicians, the greater will be the influence of the work ultimately done in this Institute. The cure of the individual must, naturally, be the most pressing and important claim on all those engaging in this work, but it must be remembered that there are far wider reaching questions behind and beyond this—the early detection of the disease, if treatment is to be most successful; and the prevention of the disease, if the community is to derive the greatest benefit from the warfare now being carried on; and these must be worked out, not in the ward merely, but also in the side-room and in the laboratory.

I have said that it is only during recent years that much has been heard of the curability of pulmonary tuberculosis, but it must be borne in mind that after the first shock produced by the observations recorded by Rokitansky and by Vir-

* A lecture delivered under the auspices of the Phipps Institute, Philadelphia, Dec. 29, 1903.

chow had lost some of its force, a number of observers drew attention to the fact that in the lungs of old people who had succumbed to diseases other than those of tuberculous origin there could often be found local apical thickening of the pleura or, still more frequently, deeply pigmented irregular scars which were evidently the result of some considerable loss of tissue at an early period of life. My attention having been drawn to this fact, I took the opportunity, after I had been appointed pathologist to the Edinburgh Royal Infirmary, to make a careful search for evidence of what I might speak of as healed tuberculous lesions, and I found that in old people such evidence was to be found in at least one out of every three who came to the post-mortem table. Nay, more, I soon became firmly convinced that even in those cases that succumbed to tuberculous disease there was usually more or less marked evidence of a sturdy war waged by the tissues against the invading tuberculous process, and that in most cases the tissues failed in their endeavor to check the advancing process simply because they were placed under disadvantageous conditions, not as the result of the action of the specific *materies morbi*, but as the result of interference with their nutrition. The cod-liver oil treatment, so long the most successful of all, had its foundation in the belief that this substance served some special nutrient or therapeutic purpose, as a result of which the tissues were strengthened and were thus enabled to resist the attacks of the disease-producing factor; whilst the present-day treatment of tuberculosis is founded on a similar belief that fresh air, good food, efficient excretion of waste products, rest (opportunity for building up the tissues, food that will supply energy with least draft on the tissues), will enable these tissues to withstand the attacks of the disease-producing factor; while to kill it in the second, or at any rate to render it harmless; and finally to assist in the removal not only of the bacillus, but of the dead or degenerated tissue in which it had managed to effect a lodgment.

It is perhaps superfluous at this stage to show slides of the tubercle bacillus, but some few of you may not have seen these microbes—low vegetable parasites—so fully studied by Robert Koch in his epoch-making work sent out from the Royal and Imperial Institute of Public Health in Berlin. (A series of slides illustrating the form and relative size of the tubercle bacilli as found in experimentally produced tuberculosis, in the tuberculosis of the human subject, and in phthisical sputa were then thrown upon the screen.) For some time after the appearance of Koch's wonderfully lucid and convincing paper a certain number of skeptics,—perfectly justifiably, no doubt, on account of the extreme novelty of the ideas so promulgated,—attempted to throw doubt first on the accuracy of the observations and then on the reliability of his conclusions, but it may now be fairly claimed that Koch's work has, in the main, withstood the attacks even of the ablest of his critics. There seems to be no manner of doubt that we may accept Koch's tubercle bacillus as the *causa causans* of tuberculosis. Here, however, let me put you on your guard, as I guard myself, against a mistake into which it is very easy to fall; *i.e.*, that because a tubercle bacillus comes near, or even into contact with, the human or brute body, an attack of tuberculosis necessarily results. This bacillus must make its way not merely onto a free surface, but into the tissues of the body, before it can do any harm; nay, more, it seems that, in the human body at any rate, the tissues must be damaged or weakened and a special mode of entrance into these damaged tissues must be prepared for the tubercle bacillus before it can work its dire effects. During the course of my work my hands have for weeks, months, or even years, been almost daily soiled with tubercle bacilli; I have no doubt that I have swallowed many, and that some have made their way into my respiratory tract; but none of these has done me much, if any, harm because while I have been working with them I have carefully protected any cuts on my hands and have refrained from working when I have been run down in any way, and especially when I have been suffering from any catarrhal processes in the respiratory or alimentary tracts.

From my experiments on animals I am satisfied, as are all experimenters, that tuberculosis is never produced without the presence and action of the tubercle bacillus, but my own observations on human patients, especially on children, confirm those of many others, that unless the tissues are weakened or damaged—*i.e.*, the soil is prepared—there can be no reaction between the bacillus and the tissues which can end in the production of a tuberculous lesion. The exciting cause must be present, but in the human subject at any rate there must also be one or more predisposing causes. In the lung this predisposing cause appears to be catarrh; that is, a congestion of the vessels of the mucous membrane, accompanied by some slight proliferation of the epithelial cells lining the air vesicles, with an increased pouring out of fluid and an emigration of a larger number of white blood-cells. In the air vesicles of the lung, especially when expansion and contraction are weak or imperfect,—*i.e.*, at the pulmonary apices in adults, near the the root of the lung in children (and in monkeys), beneath areas of adhesion between the pulmonary and costal pleuræ, and at the base of the lung when there is adhesion of the pleuræ in this position especially if the liver be adherent to the under surface of the diaphragm,—there is usually an accumulation of catarrhal products in which if bacilli gain entrance and are allowed, undisturbed by any great amount of movement, to multiply, to produce their special products and to cause those degenerative changes with which they are found to be associated causally. Once give them a footing under these conditions, and they are in a favorable position to produce tuberculosis.

It is evident from what has already been said

that the tubercle bacillus may reach the lungs by way of the air-passages; that they make their way to those points at which there is least movement and in which, as a rule, there is some degree of collapse, often associated with a condition of catarrh —*i.e.*, a condition in which the protecting layer of epithelium has been damaged, the lung tissue then being in the same position as the hand on which the epithelium has been damaged. From this coign of vantage they may be distributed, still by the air channels, to almost every part of the lung, setting up a condition of tuberculous catarrhal pneumonia characteristic of the latter stages of the so-called acute phthisis. In many cases this acute phthisis is nothing but an acute secondary pneumonic tuberculosis following a rapid distribution of tubercle bacilli embedded in the caseous material derived from a chronic primary focus. It should be noted that in these cases caseation of the epithelial tissues usually takes place at an early stage of the process.

So much for the distribution by the air-passages. We now come to a second system of distributing or infection channels which appears to play a prominent part in every case of tuberculosis, chronic or acute—the lymphatic system. Between the cells of the tissues and especially around such structures as the blood-vessels, even the smallest of them, there is a kind of network of channels or spaces (the lymph spaces) that has sometimes been compared to the system of pores seen in a sponge. Such terminal spaces gradually lead into small definite channels and finally into tubes or vessels of considerable size and with distinct walls—the lymphatic vessels. These tubes lead to little filters known as lymphatic glands. Much of the fluid that in the process of nutrition passes from the blood-vessels passes into these lymphatic spaces, and from this fluid the tissues take up their nutrient material, throwing back into it their waste or effete products. The fluid throws some of these waste materials back into the blood, but certain of the more solid particles pass to the lymphatic vessels and by them are carried to the lymphatic glands, where the coarser particles are filtered out, and where, too, certain changes appear to be effected even in the composition of the fluid lymph.

Let me give you an illustration. If a patient tattooed on the forearm could be examined within a few days of the operation, small particles of pigment would be found in the tissues (cells in and lining the lymph spaces) at various points between the tattooed patch and the elbow, and even above the tlbow. If the patient were to live for some months and then were to die, it would be found that, except at the tattooed patch and in some little hard nodules in front or at the side of the elbow or under the armpit, there is no pigment, but in these latter positions black, red, or blue pigment, according to the material used by the artist, has accumulated, often in quantities, so that it can be seen with the naked eye.

Most of you know how the glands under the arm swell after vaccination. This is because the lymphatics of the arm carry the vaccine virus to the glands, they are irritated by the vaccine matter, there is proliferation of cells, swelling of fibers, an accumulation of fluid, and enlargement of the whole gland.

Exactly the same arrangement of lymph spaces, lymph channels and lymphatic glands is met with in the lung. There are spaces around every vessel and bronchus and between the finer tissue elements; these open into lymph vessels which in turn convey the fluid to the lymphatic glands situated at the root of the lungs. It is important to bear this arrangement of the lymphatics in mind, for we find that in tuberculosis of the lung the tuberculous virus is carried from the air vesicles by the lymphatics to the lymphatic glands. The tubercle bacillus or its products appear to exert some irritant effect directly upon the cells lining the lymph spaces, as a result of which, just as in the air vesicles, we have a proliferation of the cells and a formation of new tissue sometimes resulting in caseation or the formation of a soft pultaceous mass which is supposed to resemble cheese; at others—and this is a point to be specially borne in mind—in the formation of fibrous tissue.

As regards this formation of fibrous tissue, it may be well to point out that the most marked feature in chronic tuberculosis is the formation of fibrous tissue in the pleura immediately above it; and it is an easy matter in most cases to determine roughly the comparative duration of the disease at any part of the lung by noting the thickness of the pleura and of the interlobular septa; so that in a chronic phthisis in which the patient succumbs rapidly as the result of an acute consolidation, there is usually well-marked thickening at the apex; this gradually shading off to the lower part of the upper lobe and being represented merely by a thin film of fibrin over the lower lobe.

Where the tuberculous process specially affects the adventitia or outer coat of the blood-vessels and bronchi this fibrous tissue formation is often exceedingly well marked. In some cases it would appear almost as though the tuberculous tissue at first of a type which may be compared to an irregular granulation tissue, may become converted into fibrous tissue directly; but it may be accepted as a general statement that where the tubercle bacillus manages to obtain a footing, it brings about a certain degree of caseation; but that in the immediate neighborhood of this caseous material, which in some sense appears to act as a foreign body, the fibrous tissue is partly at any rate the result of the action of this foreign body upon endothelial cells or connective tissue cells, which, after all, must be looked upon as cells of an endothelial type.

Wherever this fibrous tissue is formed, it affords evidence of a good reaction on the part of the tissues and therefore of the powers of resistance; it is by the formation of this fibrous tissue around the areas of caseation that they are cut off and the lesion localized. Where this localization

is incomplete, as it often is, the bacilli pass along by them to the lymphatic glands, here giving rise to proliferation, caseous degeneration or fibrous tissue formation, just as is the case along the lines of the lymphatics. Having once reached the glands at the root of the lung, the process may, for a time, be localized; but unless the conditions are favorable and what we may call the reaction of the tissues is good, the tuberculous virus may be carried from point to point, successive glands in the neighborhood localizing the disease for a time, but ultimately allowing of the passage of the virus to other organs.

In connection with the invasion of lymphatic glands by the tubercle bacillus, it should be noted that once a lymphatic gland is affected, the course of the lymph circulation may be diverted; and again that any area usually drained into a lymphatic gland becomes much more readily affected when that gland becomes tuberculous than before this takes place; I think I have seen cases in which the lymphatic gland appears to have become caseous or cheesy before the area drained by it had become tuberculous. It is somewhat difficult to prove this; but I show you a specimen in which we have an exact localization of a tuberculous area to that part apparently drained by a small gland at the root of the lung.

The third method of transportation of the tubercle bacillus from one point of the body to others is by way of the blood-vessels. For some time it was supposed that the acute miliary tuberculosis that so frequently supervenes on the more chronic processes, was something essentially different from the larger primary lesions; but the identity of the two sets of lesions had been accepted even before Koch had pointed out that the exciting cause of the two processes was the same. It was difficult to determine, however, how the tubercle bacillus made its way from the primary lesion to every organ and tissue of the body. Weigert was able to point out that in a case where there was tuberculosis of the wall of the thoracic duct the bacilli were carried from this lesion to the veins, from which they passed through the heart and thence were distributed to the capillaries of every part of the body. In these capillaries, blocking them and becoming attached to the endothelial lining, they again set up a proliferation in and around the capillary vessel, as a result of which the minute tubercles met with in this condition soon became manifest to the eye.

It must be remembered that these different methods of spread of the virus seldom occur alone. Whenever the air passages are affected we find, invariably, that the tubercle bacilli make their way into the surrounding lymph spaces, there giving rise to the proliferative and regenerative changes already described. Similarly, we find that in acute miliary tuberculosis there is, in each nodule, evidence of the invasion of the lymphatics by the tubercle bacillus, and it is because we have this affection of the lymphatics that the various lesions ultimately become localized. It is only through them that we can have a stimulation and proliferation of the connective tissue cells, new formation of fibrous tissue, and localization and absorption of the diseased tissues. I mention these methods of spread of the disease because in the various kinds of tuberculosis met with by the clinician, we have ample evidence that one or other predominates at different stages of the disease.

It may be well here to indicate, briefly, the history of a case of pulmonary tuberculosis, especially as by referring to this history in its various phases we may be able to gather how it is that, at one stage the disease may be perfectly curable, but how it is that, as the disease advances, the chances of permanent or even partial cure are more or less rapidly diminished. I wish you to pay special attention to the periods at which the various processes come on; and also the times during which they are prolonged; otherwise it may be difficult to understand why a patient who has had phthisis for perhaps two or three years and appears to have lost very little ground indeed, should suddenly begin to go down hill rapidly and die within a few months.

It has already been mentioned that in a case of phthisis apical catarrh is the first condition noticed, this being accompanied by congestion and followed by some consolidation the result of proliferation of the epithelial cells, such cells gradually accumulating and coming to fill the air vesicle. This breeding-ground for the tubercle bacillus may gradually spread in area; but it will be found that the bacilli causing degeneration of the epithelium make their way into the surrounding lymph spaces, there, especially if the tissues are well nourished, giving rise to the formation of fibrous tissue.

If at this stage the patient be placed under favorable conditions, of nutriment, of rest, so that the waste products of the body may be carried away regularly and systematically, the reaction of the tissues is so complete that the dead patch is practically surrounded and cut off; the bacilli remain inactive in the dead mass; or they may even be killed. The degenerated tissue is absorbed very gradually and there may be complete "cure," especially when the initial lesion has not reached any very great size. The loss of respiratory surface is so slight and the reserve so great that the patient may be considered to be practically normal again.

If, however, the patient be not placed under favorable conditions, or if after a short period of treatment he returns to his old life and habits, this focus of dead material may ultimately break through the surrounding layer of limiting tissue and a further considerable patch of tuberculous consolidation may be the result.

In most cases, especially if there be intermittent congestion of the surrounding tissues, the degenerated or caseous material may become softened, and it is during this stage of softening that secondary infection goes on most readily.

Let us suppose that this mass cut off from the bronchus with which the air vesicles were orig-

inally associated, extends to the wall, perhaps of another bronchus; as it advances in this wall it cuts off the vascular supply, first that of the peribronchial tissue and then that of the submucous tissue, until at last by destroying the vitality of the bronchial wall it brings about a process of ulceration; then the tuberculous material with its contained bacillus may immediately be carried into the air passages, whence it may be expectorated almost entirely, though in most cases a certain proportion of the softened material along with the bacilli is carried to other areas, where fresh tuberculous catarrhal pneumonia is induced, and the whole process may be repeated but upon a more extensive scale. This process may be again repeated—at each repetition, larger and larger areas being affected. It is evident that in such cases as those just described, the loss of lung tissue may be very great indeed, whether it be broken down or not—*i.e.*, whether the lung be merely consolidated or whether it be excavated. Even the great reserve mentioned above is unequal to the draft made on it, and even should the patient be patched up for a time he must face the fact that he is not cured and never can be, though under proper treatment and with great care he may continue to lead a useful if not very active life.

It is sometimes difficult to understand why the small hemorrhages so characteristic of the early stage of phthisis should occur so frequently especially when we remember that in the tuberculous areas themselves the blood-vessels are practically obliterated. It must be remembered, however, that around each tuberculous area the conditions of the vascular circulation are somewhat altered, owing to the fact that some of the vessels are closed; as a result of all this a collateral circulation must be set up and maintained. Moreover, an increased quantity of blood is required to meet the wants of the proliferating tissues; but we find that the hemorrhages usually take place as the result of some extra temporary strain and are an indication of local changes. It will be noted that in some of the specimens I show that we have a systematic invasion of the lung commencing at the apex and gradually working toward the base. It will be noted, moreover, that the basal processes are always more extensive, that the consolidation is more diffuse, and the degeneration more rapid than at the apex; that we have in fact a more markedly caseating catarrhal type in this position than at the apex. The whole of the lower lobe of the lung may be invaded in a few weeks, especially when the resisting powers of the tissues have been gradually broken down by overwork, general ill health, want of sufficient nutriment, imperfect oxidation of the blood and accumulation of waste products in the tissues.

These factors do not act at once; but at work over considerable periods they gradually wear down the resistance of the tissues, with the result that the tubercle bacillus finds an easy prey wherever it finds lodgment.

In addition to the catarrhal process, there is in most of these rapid cases of basal phthisis a more acute pneumonic condition, the air vesicles in the spaces between the catarrhal pneumonic patches in such cases being filled with a fibrinous exudate. The process seems to be associated with the alterations in the circulation, but partly to be the result of a secondary infection; wherever it occurs, however, it is a serious factor in the production of consolidation, and always accelerates the rapidity of the process, patients so affected, as a rule, dying quickly.

It will be seen at once from this rough description that a physician has a considerable period during which he may hope to treat his patient successfully, but that at any moment, almost, a series of more acute changes may supervene after which he has no right to expect recovery; though it must be acknowledged that in a few cases patients do recover even after such expectation is no longer justifiable. Nature is always more powerful than we give her credit for, and often helps us when we have given up all hope. This, however, is something we should never presume on, and the importance of the early diagnosis of tuberculosis can scarcely be too keenly appreciated, nor that of early treatment.

We now come to a phase of the question that has been recognized by many physicians but one that is not so generally recognized by the patient. A patient who has once suffered from tuberculosis must remember that although he may be partially protected (though of that, however, we as yet know nothing), he does not enjoy any definite immunity against future attacks of the disease; and it is absurd for any one to decry a system of treatment because it does not confer a lifelong immunity to the disease against which it is directed. I show you a specimen in which there is an old scar in the lung, from which all tuberculous material had disappeared, leaving a little nodule of pigmented fibrous tissue surrounding a few particles of calcareous matter. That patient suffered from phthisis many years ago and had recovered; but you will see that throughout the remainder of the lung we have now the lesions of an acute miliary tuberculosis; the patient succumbed to an infection in all probability of entirely new origin; though it is possible that it may have been the outcome of some old but latent lesion either in the lung or in some other part of the body, from which tuberculous virus has made its way into the blood-vessels and thence has been distributed throughout the body.

Such a case as this to my mind, though exceedingly encouraging in many ways, should lead us to insist that patients even after discharge from sanatoria where the treatment has been successful, should continue the treatment, perhaps in a modified form, throughout their whole life; as it is impossible to state when a patient can come back to the old conditions of life with impunity; in fact, one may lay it down as a general proposition that it is only as we insist on the improvement of the conditions of life wherever such im-

provement is possible, that we shall be able to diminish the morbidity as apart from the mortality, of tuberculosis. It is here that the medical officers of health, and sanitary officers can play so large a part; and that an institution of this kind can do so much to spread a knowledge of the importance of light and air in the home and in the workshop, of sufficient food even though plain, of the danger of prolonged periods of overwork, except in the case of the very strongest; and of the importance of periods of rest during which the organs and tissues of the body must not only be built up, but may get rid of the waste material that accumulates so rapidly during periods of active exertion.

This brings us to a very important question indeed. Although I have every faith in sending patients who can afford it to places where they can comfortably remain in the open air and where there is plenty of light, I think there is a danger, and a very great danger, of overlooking the fact that the open-air treatment may be carried out at the patient's home, and that so far as this branch of the treatment is concerned it is not so much a matter of getting a good climate as of getting pure, fresh air for the patient.

There can be no doubt that the sanatorium treatment has been successful, not because of any special climatic conditions associated with each institution, but because whatever the climate the patient has been encouraged to live practically in the open; diet, exercise, and rest, of course, being carefully attended to. All acknowledge that a sanatorium treatment is of inestimable value in tiding over the difficult and dangerous early period of the disease; but it will be still more valuable just in so far as it teaches the patient to carry out in his own home the principles and methods adopted in the sanatorium. It always seems to me that a patient will be much more likely to have faith in the efficacy of the methods used, if they are carried on in familiar surroundings and under conditions of climate, etc., to which he is usually exposed. If he is sent to a special climate resort, he is apt to think that the success of his treatment depends on something special in the climate; and while this is of course the case to some extent, in so far that in a bright, dry, bracing climate the open-air treatment is more agreeable and a cure effected somewhat more quickly perhaps, there is no fundamental differences between the two, the closer you can bring your patient to his every-day manner of life during treatment the more likely he will be to carry out your instructions after discharge from the sanatorium.

I may say that at Cambridge, a place little above the sea-level, situated in the fen district where fogs are frequent and sometimes very dense, great success has been attained in the open-air treatment of phthisical patients in the Addenbrookes Hospital. I mention this fact for what it is worth; but I think that it bears out the contention of some that the method of treatment is in most cases more important than the exact place in which it is carried on.

Ladies and gentlemen, those who are responsible for the inception, organization and working of this Institution, have undertaken what most of us consider to be one of the most beneficent works on which men can engage. The endowment is munificent; and as the workers are both capable and enthusiastic, I think that we may look forward with very bright hope to the outcome of the work carried on. But the work to be done cannot all be accomplished even under the favorable conditions that here obtain; and I would ask you not to be disappointed should you not attain all that you hope in the immediate future. There is much quiet and steady spade work to be done. You will, I know, relieve and cure many patients; but you have then touched but the fringe of a great problem. You have to determine the exact pathological conditions met with in individual patients and in groups; you have still much to learn concerning the condition of nutrition, of waste, and of repair; you have physical problems, chemical problems, bacteriological problems and others of the greatest complexity; these can be undertaken only by men skilled in methods and trained in accurate observation. They may have to work for years before they are able to gain results that can be utilized, or that can be brought into a great scheme of knowledge, from which further advances can be made; but we may all entertain the hope, and one well-founded, that under honest, persevering, patient investigation even the most difficult problems may be compelled to give up their solution. While working for the benefit of the individual, we must keep our mental vision fixed on a point beyond; on the possibility of preventing the invasion of the tissues by the tubercle bacillus; of studying the life-history of this organism so that in time as we gain the knowledge of the conditions under which it exists, both outside and in the body, we may gradually so circumscribe its sphere of operations that it may no longer remain a factor of disease especially when we are wise enough to insist on those improved sanitary and social conditions without whose aid the tubercle bacillus even to-day would lose much of the terror attached to its name. I congratulate the Henry Phipps Institute on what it has already achieved; but I hope for it and those associated with it a still more useful, beneficent and brilliant future.

Cryoscopy of Animal Organs.—Just as normal blood and urine freezes at a certain temperature, definite figures can be obtained for entire organs, but the normal fluctuations are somewhat greater. The experiments of BLANCK (Virchow's Archiv, Vol. 174, No. 2) were conducted chiefly with animal kidneys. The freezing point lies between —0.86° C. and —1.35° C., and is generally the same on both sides. By passing large quantities of water through the kidneys only slight changes occur, but alkaline waters have more effect. Diuretics such as diuretin and agurin reduce the osmotic tension of the kidney considerably. Phloridzin is without action; likewise chromate of potash and urinary stasis change the freezing point but little.

MEDICAL PROGRESS.

MEDICINE.

Some Points in Diagnosis of Smallpox.—The recent outbreak of smallpox in New York City has furnished considerable material for valuable conclusions in regard to the diagnosis of this disease. W. L. SOMERSET (N. Y. Med. Jour., Nov. 21, 1903), furnishes some very helpful hints in regard to the differential diagnosis of the milder cases, which are, as a rule, the ones which give rise to the greatest difficulties in diagnosis. Varicella is the disease which causes, perhaps, the most confusion, for there are some cases of this affection which closely simulate variola. Varicella can vary from an eruption most abundant to a few scattered vesicles or pustules. In many cases it invades the palms and soles of the feet and may attack the mucous membranes. The patient may also be very sick with considerable temperature. If, however, in variola the lesions are abundant they will be most so on the face—in varicella, on the trunk. Variola does not produce vesicles in twenty-four hours. Varicella is seldom seen before vesicles appear, and if so the diagnosis cannot be made. Varicella vesicles are translucent, the epidermis covering being very thin. They are never umbilicated, but when beginning to dry down they may be covered by apex crusts which require close inspection to be distinguished from umbilications. Varicella has no papular stage. The elevation of a chickenpox lesion is due, from the start, to the pushing up of the outer epidermis layer by serum, and this occurs within the first twenty-four hours. Concerning lesions succeeding each other in point of time, so that early and late appear side by side, it can only be said to be usual in one and exceptional in the other. In general, when the decision rests between these two diseases, if it is variola, the pathognomonic lesions will be found upon the face and extremities; if varicella, on the trunk. A face invaded by variola, confluent in the macular stage, may resemble measles, but there is no photophobia, no lacrymal flow, the invasion is shorter and the symptoms remit as the eruption appears. A careful examination of the history, the individual lesions and their site ought to differentiate all cases of variola from the pustular syphilide. Smallpox of to-day has not acquired any new capabilities, but it simply fails more and more to live up to its former standard. It may all be accounted for by diminished virulence of the contagium or diminished susceptibility of the patient.

Pulmonary and Cardiac Disturbances Accompanying Diseases of the Biliary Passages.—There have been observed many cases of biliary colic in which the cardinal symptoms of the affection such as pain on the right side and the like have been absent; the attacks being accompanied by cardiac or pulmonary phenomena, such as asthma, disturbance of the pulse rate and others. In some cases there even appeared an insufficiency of one of the cardiac valves, which, however, disappeared with the cessation of the attack. K. P. ROUSSK (Prakt. Vrach, Oct. 18 and 25, 1903), reports three cases of biliary calculi in which these reflex cardiopulmonary disturbances were quite marked during the attacks of colic. Thus one of them suffered from very severe dyspnea, during which there was a high degree of oxygen hunger. It is of interest to note that physical examination during one of these attacks of dyspnea failed to detect any difficulty in the ingress of air to the lungs. The heart showed an enlargement principally of the right ventricle, accentuation on the second pulmonary sound, and insufficiency of the mitral valve. As regards the pathogenesis of these disturbances the author considers them under three heads: Mechanical, poisonous (intoxication), and reflex. Of these he regards the last as of the greatest importance. It is considered that the mucous membrane of the biliary ducts serves as the starting point of the reflex act. The muscles of the biliary ducts and sphincter at the junction of the ductus choledochus and the duodenum are innervated by the vagus and sympathicus. This was proven experimentally, as well as during a laparotomy, when the operator by manipulating the region about the ductus choledochus caused repeatedly cessation of the right pulse, which reappeared as soon as the manipulations were stopped. The sympathetic is thought to be the path through which the reflex travels. In the absence of any causative agencies in the lungs and heart in certain cases of dyspnea the author advises to remember the possibility of cholelithiasis as the underlying cause of the condition.

Cysts of the Pancreas.—In an extensive paper, P. LAZARUS (Zeitsch. f. klin. Med., Vol. 51, Nos. 1 and 2) distinguishes five common varieties of pancreatic cysts. The gastrohepatic form, where the cysts develop between liver and lesser curvature, is rare. The dulness will here merge into the hepatic or cardiac dulness and with continued growth the cysts will fill up the lesser mental cavity and even extend through the foramen of Winslow. Trauma is the usual cause here, since the portion from which these cysts originate, the upper and anterior parts of the body, are exposed to injury more than other parts. The development in so unusual a direction is best explained by pathological and physiological adhesions, with the stomach, which prevent a downward extension. Sometimes the position is distinctly subphrenic, when adhesions to the diaphragm and vena cava are common. The retroventricular variety is still less frequent and especially unsuited for operation. Perigastritis and peripancreatitis generally present upward or downward growth. The typical pancreatic cyst is the gastrocolic species, since the natural tendency for all growths from the pancreas is into the omental bursa. The stomach will cover the upper and the colon the lower segment. In a fourth form the cyst extends into the transverse mesocolon and depending upon the position of the transverse colon, three subvarieties may be distinguished: the intermediary, superior and inferior. Lastly a prevertebral type is recognized, where the growth is downward in front of the vertebral column and kidneys. The most infrequent starting-point of cysts is the head, since the secretion can generally find an exit through the accessory duct if the main duct is blocked. Compression of the duodenum is common here and a sudden increase in volume through hemorrhage may lead to jaundice and acute intestinal obstruction. Edema of the lower extremities, owing to venous obstruction, has been noticed, and ascites from portal thrombosis may develop. Occasionally the right kidney is displaced and compressed, and rupture into the intestines may take place. Cysts of the body readily press on the stomach, colon and celiac plexus. Cysts of the tail are most common, are usually movable, and may have a pedicle so that they sink into the lower abdomen. Cysts with epithelial lining may be definite neoplasms, and here the cystoma glandulare proliferum is the best studied type. They may also result from retention secondary to interstitial pancreatitis, or from degeneration after postinfectious acute pancreatitis. False cysts, on the other hand, have as their most common cause softening, autodigestion after trauma and discharge of secretion and blood into the omentum after rupture. The remaining pancreatic tissue is often altered considerably; even in experimental cysts the surrounding tissue is much changed by interstitial inflammation or necrosis. The

contents of the cysts are said to be characteristic in that they contain pancreatic fluid, but all three ferments are detected but rarely. The diastatic ferment is most common, the tryptic least, since it is used up in digesting blood and tissue-shreds. Even if it occurs in the fluid withdrawn from an obscure cyst, this does not prove the pancreatic origin of the latter, since fluid from ovarian cysts may occasionally digest fibrin. Traumatic cysts need not always contain blood, since complete digestion and absorption often occurs in several weeks. Other common ingredients are serum-albumin (up to 2 per cent.), serum-globulin, mucin, pepton, and, more rarely, cholestrin, leucin, tyrosin and sugar. The sediment consists of epithelium, fattily degenerated round cells, fat crystals, leucocytes, altered red cells, pigment, mucin and salts. With exception of a few congenital cases, the most common etiological factors are trauma and chronic indurative changes, secondary to gastroduodenal catarrh, cholelithiasis, arteriosclerosis, alcoholism and syphilis; the acute infectious diseases and pregnancy play a less important part. The development is occasionally latent until the neighboring organs are pressed upon and the functions of the pancreas itself suffer, but often the symptoms of the primary disease precede. Where diabetes is present, digestion is seriously interfered with, so that the stools are rich in fat and undigested muscle-fibers, but such stools are by no means pathognomonic, since fat may be absent in advanced cases and muscle-fibers may also occur in normal feces. The earliest and most constant symptom is pain; it may persist for years before the real condition is suspected, and is generally localized where the tumor develops. Occasionally the pains resemble gastric crises and they are especially severe where stones are present. Other important signs are intermittent increase and disappearance of the tumor and emaciation, while salivation was not observed. The most marked pressure symptoms occur with cysts of the head; they are responsible for the large number of gastric and intestinal complaints, which are invariably present. Rare complications are compression of the choledochus, with icterus and colic; of the portal vein with ascites; of the abdominal aorta with pathological murmurs and pulsation and of the splenic vessels with splenic enlargement. Traumatic cysts are generally ushered in by signs of shock, hemorrhage and injury of other abdominal organs, especially the stomach, and they may be accompanied by large omental hematomata, which generally heal rapidly after they are evacuated. The processes of cyst-formation and induration may here require many years. A rare complication is displacement of the ureter; a most dangerous one, suppuration and rupture of the cyst. Suppurative peritonitis is not due to discharge of panereatic fluid into the peritoneum, since this is aseptic, but invariably to bacterial infection from the blood or gastro-intestinal tract.

SURGERY.

Functional Renal Diagnosis.—Concerning cryoscopic renal diagnosis, the opinions are still very much divided and enthusiastic reports alternate with more conservative articles. The paper of A. GÖBELL (Münch. med. Woch., Nov. 17, 1903) belongs to the latter class, for its author had some experiences which make him doubt that absolute reliance in the method is safe. The character of the food and the amount of fluid ingested seem to have a marked influence upon the freezing-point, but even if the diet is simple and absolutely uniform the figures vary within very wide limits. Several cases are reported where the wrong kidney would have been extirpated, if the molecular concentration alone had been taken into consideration. Much more satisfactory results are obtained if attention is also paid to the daily amount of urine and if renal activity is expressed in so many daily molecules. In all cases the diet should be controlled and the catheters should be introduced a definite period after a meal and left in position for at least two to three hours, since fluctuations are very common. At best the method is only approximate, but, though troublesome, it offers valuable aid in conjunction with other data.

Improvements in Narcosis.—A series of articles on narcosis is contained in the Münch. med. Woch., Nov. 17, 1903, which give a good account of the modern tendencies in this important specialty. H. FUCHS says ether is again taking the place of chloroform, since it was shown that the ideal ether narcosis is one not accompanied by suffocation and not necessitating the use of a large amount of the drug. The best method at present is the following: The patient first receives a dose of morphine half an hour before the operation. In case of laparotomies it is best to substitute codeine (1 to 2½ grains), since this is less liable to interfere with peristalsis after the operation. The patient is then etherized, drop by drop, with an ordinary chloroform mask. The musculature is generally relaxed in ten to twenty minutes after the use of one to two ounces of ether. Sometimes it is desirable to hasten the first stage by giving a few drops of chloroform after the ether has sufficiently stimulated the heart. The best position for the head is that of overextension by means of a pillow under the shoulders. The after-effects are exceptionally mild, and collapse during operation is almost impossible. C. HOFMANN also looks upon the drop-method of etherizing as the narcosis of the future; he believes it approaches the ideal in every way. C. HARTOG has a few words to say in favor of the morphine-scopolamine method which he considers free from danger if used properly, and if followed by ether-narcosis. Half a milligram of scopolamine ($^1/_{120}$ grain), and one centigram ($^1/_6$ grain) of morphine are injected ½ to 1 hour before operation, when the patients will invariably go to sleep with a minimum amount of ether and will exhibit none of the usual disagreeable symptoms. B. KORFF employs twice the amount of scopolamine and ⅓ grain of morphine distributed over three doses given 2½, 1½, and ½ hours before the operation, and generally dispenses with other anesthetics. Pulse and respiration are affected only slightly, salivation is moderate, and the intestines and urine are not affected, since the bad effects of each drug are paralyzed by the other. Supervision is hardly necessary, though sometimes the tongue must be pulled forward. The stomach need not be entirely empty before operation and small amounts of water may be given soon after, as they do not provoke vomiting.

Traumatic Aneurism of the Subclavian, Produced by Fracture of the Clavicle.—Aneurism of the subclavian artery is rare among surgical lesions. When the condition has been brought about by fracture of the clavicle, its rarity is so great as to make the condition almost anomalous. WILLIAM TAYLOR (Annals of Surgery, Nov., 1903), reports a case of this complication. It is remarkable that injury to the bone so frequently leads to arterial or venous rupture, and likewise remarkable, in view of the proximity of the apices of the lungs and the cords of the brachial plexus, that these two should be comparatively immune from injury. In the Lancet of July 6, 1850, Sir Robert Peel is reported to have died from an injury to the subclavian vein, due to fractured clavicle. As in probably all cases, there was here a comminuted fracture of the clavicle. The English and French lit-

erature contains only 10 or 20 cases of injury to the nerves and 5 cases of injury to the artery. There are many others recorded which terminated fatally, but which were associated with crushing injuries, or were lesions produced by bullets or other penetrating missiles. In these cases the complications have been attributed rather to the passage of the bullet or sabre, as the case might be, than to the fragments of the broken bone. Furthermore, it is probable that in the majority of these cases not alone is the clavicle broken, but the first and second ribs as well. The bone spicules, if such existed, having arisen from the ribs, rather than from the clavicle. The case reported by Taylor was one of the few which has been cured by operation. It was decided to place a temporary ligature on the first portion of the subclavian. An incision was therefore made around the inner end of the clavicle and the bone was divided two inches from its end and the part resected. The encroachment of the tumor on the small space occupied by this portion of the vessel gave rise to insurmountable difficulties. Recourse was had to an opening of the sac and attempt to secure the injured vessel. Accordingly the middle third of the clavicle was removed, so that digital pressure might be applied directly. The tumor was incised and the clots turned out. It was impossible to pass an aneurism needle, therefore forceps were applied to the opening in the artery. The convalescence was uneventful, the forceps having been removed on the twelfth day. The patient has not yet entirely recovered the use of his arm, but power is gradually returning.

New Method of Intestinal Union.—Two important points in the problem of intestinal union are still unsettled. The first is the question of the penetration of all coats of the intestines, and second the use of a continuous or an interrupted suture. J. SHELTON HORSLEY (Annals of Surgery, Nov., 1903) details the steps of his operation as follows: Intestinal clamps are placed, the mesentery is incised, and if need be, resected. The forceps that clamp the vessels are also made to include both layers of peritoneum as they separate from the mesentery to encircle the bowels. The tissue within the bite of the forceps is ligated with fine silk so covering the bowel, which is usually devoid of peritoneum. The bowel is then divided and the convex borders placed in contact and held there with forceps. Both walls of the intestines are now transfixed with No. 2 braided silk, about half-way between the mesenteric insertion and the forceps. This is tied. Part of the intestinal walls forming a crescentic area, the center of which is held by the forceps, is now cut out, and the cut edges sutured through and through. The needle is then thrust directly through the intestinal wall close to the right of its last puncture and emerges from the serosa. The character of the stitch is now changed to a Cushing right angle continuous suture, penetrating all coats and inverting the margins. Firm traction is maintained on the thread. When the first knot is reached it is invaginated and the suture continued by two more insertions of the needle. After this suturing is completed, scarcely any of the thread can be seen. The mesentery is then sewed up with a continuous suture. Nineteen dogs were operated upon by this method without a death. Evans has demonstrated that the danger from stricture following intestinal resection is overrated. Owing to the excision of the crescentic area, the diameter of the intestine at the point of union is greater than its normal size. The author believes the continuous suture is by all odds preferable to the interrupted. The operation can be done in eight minutes. The results of hydrostatic pressure on the unions obtained by this stitch, show that a suture through all coats is stronger during the first six days than one including the submucosa only. The Connell method stands more pressure at the end of the first and the sixth day, the new method stands as much as the Connell during the critical time of intestinal union, which is the third and fourth days.

Dislocation of the Ulnar Nerve.—Only 15 cases of this lesion had been reported, and until the present paper, no summary had been made. FARRAR COBB (Annals of Surgery, Nov., 1903) analyzes these and adds a case of his own. His conclusions are first, that the operation for this rare but disabling lesion give every chance of cure. Second, it is only in the most severe cases of dislocation that operation should be undertaken, and then only for the symptoms caused by the dislocation rather than for the lesion itself. Third, the steps of the operation are as follows: A curved incision 3½ inches long, midway between the olecranon and the tip of the internal condyle. The fibers of the triceps muscle should now be dissected up and removed from the groove previously and normally occupied by the nerve. The nerve is now placed in its groove, and the fibers, together with the portion of the fascia and the triceps are carefully sutured to the fascia of the flexo-carpi-ulnaris. The arm is put up in extension on a straight internal splint. There should be no pain after the operation. At the end of two weeks, the straight splint should be substituted for a right angle splint for one week. Active motion of the arm may be allowed after four weeks.

GENITO-URINARY AND SKIN DISEASES.

Multiple Zona.—Cases of symmetrical bilateral "herpes zoster" are extremely rare, but there are certainly many in which the eruption appears in the distribution of more than one nerve. Of 231 cases of zona seen by P. FABRE (Le Progrès Médical, Oct. 24, 1903) not one was symmetrical and only one bilateral, this involving a right intercostal space, and the back of the left thigh along the sciatica. There were duplicate unilateral zonas in four cases, one affecting the second, third and fourth intercostal spaces and the arm, the other three the lumbo-inguinal region and the corresponding thigh. Of bifurcated zonas there were seventeen, and four in which there was a true trifurcation. Zona, is, therefore, not always a single line or band, nor is it an eruption always limited to the course or distribution of a single nerve.

Choice of Operation for Hypertrophied Prostate.—Operations upon the prostate gland are no longer looked upon with so much dread as formerly and there is little doubt but what they will soon be considered within the province of most of our able surgeons. W. MEYER (Med. Rec., Oct. 24, 1903) gives his experiences with the various operations upon the prostate during the past five or six years and now believes that those operations making a direct attack upon the enlarged gland are preferable to those aiming to exert an indirect influence. Operations upon the testicles and vas deferens should be done only as a very last resort and only after a direct attack has first been made. There are two useful procedures for the direct treatment, viz., prostatectomy and galvanocaustic prostatotomy (Bottini's operation). If the gland can be removed by operating from below, this procedure deserves the preference, were it for the sole reason that the wound which is made for shelling out the gland can be at the same time used for drainage. Besides this, perineal prostatectomy has the advantage of permitting operation under the operator's eyes. In selecting the method indicated in the given case we must individualize and be guided by anatomic,

pathologic and social conditions. He almost invariably recommends the cutting operation in patients with a large hard gland, also in patients with a gland of medium consistency if they seem strong enough to stand the operation and general anesthesia. He further advises protatectomy when the median lobe is present or in patients who are desirous of being relieved of their trouble at one sitting at all hazards. If the gland is soft and compressible, particularly if not palpable by rectum (the cystoscope haveing determined the diagnosis); if the patient is old and run down, he advises the Bottini operation, making the family fully aware of what may be expected. This does not preclude the possibility of a subsequent prostatectomy if necessary, and usually in itself secures good results at much less risk to the patient's life. Surgeons should, therefore, familiarize themselves with both operations in order to be in a position to do justice to their patients, and to insure that debilitated men who seem unfit subjects for the more radical operation may not be at once relegated to catheter life.

Urticaria Medicamentosa.—A hitherto unnoticed sequela from the use of suprarenal extract is reported by A. ROSENBERG (Berl. klin. Woch., Oct. 12, 1903). The patient, a young woman in good physical condition, presented what appeared to be symptoms of an accessory nasal sinusitis. A small swab saturated with suprarenal extract was applied to the swollen inferior turbinate. It brought on an unpleasant disturbance of smell and within a few hours was followed by a diffuse urticaria extending over the trunk and arms. This disappeared after a short time, but about a week later, when the treatment was repeated, the same trouble reappeared. Swabs saturated with water or cocaine failed to produce the same effect. The author believes that this urticaria was caused either by the absorption of the drug or was a reflex disturbance brought about by an irritation of the olfactory nerve, the patient complaining of an unpleasant sensation of smell at the time when the suprarenal extract was applied.

Operative Cure of Sterility from Obstruction at the Epididymis.—Experimental work upon dogs has shown that when the vas was cut a short distance from its origin in the epididymis and an anastomosis of this divided end with the heads of the epididymis was made subsequent ejaculations were found to contain apparently normal spermatozooids. E. MARTIN (N. Y. Med. Jour., Oct. 10, 1903) has learned by morphological study of the human spermatozooid taken from the rete testis, the upper part of the epididymis and the vas that these spermatozooids seemed to undergo a developmental change in their progress through the organ, and he was therefore a little doubtful concerning the ultimate success of such a transplanting operation in man. An opportunity for testing the result of such an operation was given him by a man who had been married for several years and to whom no children had been born. The wife had been subjected to dilatation and curettement before it was discovered that her husband was sterile. He had suffered from two severe attacks of gonorrhea, one accompanied with bilateral epididymitis. Repeated examination of the seminal fluid resulted in the finding of only two or three poorly formed spermatozooids on one or two occasions. Operation was decided upon, and the vas of the left side was freed at about the level of the top of the testis, and, by means of a sharp-pointed pair of scissors, a slender bistoury, and a grooved director, its lumen was opened by a longitudinal cut a quarter of an inch long. A portion of the head of the epididymis was then picked up and excised. A few minute whitish drops at once appeared on the cut surface, made up mostly of spermatozooids. Into the wound of the epididymis the vas was implanted by means of fine silver wire and the skin closed by catgut. Examination of the spermatic fluid subsequently showed a goodly number of spermatozooids, and 281 days after resuming marital relations his wife was delivered of a normal girl baby.

Value of Albuminuria in Differentiating Pyelitis from Cystitis.—There are many cases of pyelitis in which the local symptoms are so indefinite that a diagnosis becomes very difficult. Even a careful microscopical examination may disclose nothing characteristic, for it is well known that no great reliance can be placed upon the so-called epithelial cells of the pelvis. Cystoscopy, ureteral catheterization and the freezing point of the urine are all very helpful means of diagnosis in the hands of the trained, but these means are by no means accessible to the ordinary physician. T. R. BROWN (N. Y. Med. Jour., Oct. 17, 1903) has found that the amount of albuminuria is of great help in differentiating a cystitis from pyelitis. Pyemia due to a cystitis, even if of high grade, is associated with but a small amount of albumin if the urine is examined soon after catherization, and if the pyemia is not accompanied by hematuria. On the other hand, in all cases of pyelitis, even if the pyemia is slight, there is always, or at least almost always, a considerable quantity of albumin present. A microscopical examination will easily disclose the presence of red blood cells if they are in sufficient number to be of any importance in causing the albuminuria.

HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

Action of Purin Bodies.—The purin bodies normally excreted in the urine (guanin, hypoxanthin, uric acid) were injected in medium doses into rabbits by J. W. HALL (Virchow's Archiv, Vol. 174, No. 2) in order to study their effect upon the organism. Considerable loss of weight followed, the blood-pressure and size of the heart were not affected and in the blood the lymphocytes, multinuclear leucocytes and basophile cells were augmented in number. A histological examination of the heart, large arteries, lung and nerve-cells gave no change; the kidneys showed slight hyperemia, slight thickening of the intima of the smaller arterioles and beginning degeneration of the secreting epithelium. In the bone-marrow very many lymphocytes and nucleated reds were found, and cellular degeneration and vacuolization occurred in the liver. It is possible that some of the changes of chronic interstitial nephritis in man are due to retained purin bodies.

Disintegration of Rabid Brain Substance.—Although no organism causally related to rabies has been demonstrated in the tissues of animals dying of this infection, according to J. O. W. BARRATT (Proc. of the Royal Soc., Oct. 31, 1903), yet it has long been supposed that the virus consists of an organism, since it is capable of indefinite increase when passed from animal to animal. This supposition is also strengthened by the following experiment performed by the author: The rabid brain substance of a rabbit was disintegrated at the temperature of liquid air for from half to one hour, and it was found that this abolished its virulence. It was now necessary to ascertain whether any substance was produced or set free during disintegration, which was in itself capable of destroying "virus fixe," since it is known that immunizing substances are formed by animals infected with, or immunized against, rabies. Intracerebral injection of a mixture of disintegrated and virulent brain substance, in a preparation of 5 to 1, practised upon rabbits, was followed by rabies, thus showing the absence of a rabicide substance in disintegrated rabid brain. MacFayden proved that exposure of rabid brain-substance to the temperature of liquid air for three months fails to deprive it of its virulence.

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No. 111 FIFTH AVENUE, NEW YORK.

Subscription Price, including postage in U. S. and Canada.

PER ANNUM IN ADVANCE	$4.00
SINGLE COPIES	.10
WITH THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, PER ANNUM . .	8.00

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LEA BROTHERS & CO.,
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SATURDAY, JANUARY 2, 1904.

RESPONSIBILITY FOR TYPHOID FEVER.

THE year just closing has been remarkable for its epidemics of typhoid. Not only has the number been large, but there have been two outbreaks which must be regarded as the greatest explosions of typhoid fever which this country has seen. At Ithaca there were 1,300 cases, and at Butler, Pa., according to an exhaustive report by Dr. George A. Soper, published in the *Engineering News* of December 24, the number of cases to December 17 was 1,270, with a prospect of more.

That typhoid is increasing in sporadic and endemic, as well as epidemic, form, is a fact which is attested by the newspapers and the reports of health boards; and this in the face of the fact that there is no communicable disease whose channels of infection are more clearly understood and can be more securely guarded. That public interest in its prevention is sporadic and ephemeral is not only to be deprecated but it should be set down as a national crime.

Typhoid epidemics are usually due, in the first place, to neglect on the part of purveyors of water and milk, and incompetence on the part of boards of health. Proper sanitary surveillance in these directions is capable of affording complete protection against typhoid, but sufficient care is rarely exercised to keep public water and milk supplies free from the danger of infection. After reading the article on "The Management of Typhoid Fever Epidemics," which appears in this issue, it seems to be a matter of chance that epidemics are not more numerous than they are. The public should recognize that it is the business of the purveyors of water and milk to take the measures necessary for their protection and the business of boards of health to see that such measures are faithfully carried out. The growing frequency of typhoid epidemics indicates that legal action for criminal carelessness in failing to exercise due diligence is apparently needed to bring water works officials, dairymen and boards of health to a proper sense of their responsibilities.

In the second place, typhoid fever spreads to a needless extent in households, through the want of a knowledge of the preventive measures which should be adopted. Such precautions as are taken in families in which a case of fever occurs are usually those which can be gleaned from the hasty instructions of the physician, and too frequently consist of the perfunctory use of a certain patented brand of disinfectant. If physicians would stop to consider that many of these so-called disinfectants are not only adulterated and unscientific in character, but ineffective in action and far inferior to simple reagents which can easily be prepared at home, they would probably hesitate to give them an endorsement. Typhoid fever spreads in households chiefly because disinfection, which is both necessary and sufficient as a protection against the transmission of the disease, is usually a farce.

There is a distinct lesson in all this. It is clear that reforms are needed at the water works, dairy and sick room. Prevention must be practised and prevention must be taught. Public and domestic hygiene should be recognized as a factor in education. Our universities, colleges and medical schools, which now generally omit this subject from their curricula or teach it in a feeble and perfunctory way, should establish chairs and departments of hygiene. With a settled purpose to accomplish this, means can be found for securing the funds. It is said that philanthropists of enormous means are seeking opportunities for the investment of money where it will be useful in reducing the sum of human suffering and will advance the best interests of mankind. No better opportunity for such noble work could be offered to men of wealth than the founding of chairs of hygiene in our medical schools and universities.

AUTOMOBILING AND NERVOUS MANIFESTATIONS.

IT is evident from recent reports in the medical press, especially in France, where the practice of automobiling is more common than in this country, that in the very near future physicians are to be called upon to treat a number of nervous symptoms traceable to the excitement and mental tension of rapid traveling with the emotional repression necessary to secure a reasonable feeling of enjoyment, while speeding rapidly with risks and dangers constantly at hand. The most distinctive symptom complex that has thus far been described is a neurosis of anxiety.

In a recent study containing some interesting observations on the neurosis of anxiety in the *Archives de Neurologie* (Vol. 15, 1903, No. 89), Dr. Hartenburg describes a typical case that may prove a helpful guide to those who are brought in professional contact with the affection for the first time. The automobilist patient in this case had no difficulties as long as he confined his riding to short trips not far from his home; when he attempted long journeys, however, symptoms developed. In spite of the great fatigue consequent upon the close, prolonged attention in guiding his machine the patient was able to continue his riding for three successive days, but on the fourth day he suffered from severe symptoms. There was pain in the epigastric region, and the general nervousness incident to extreme emotion. This was followed by a chill, with chattering of teeth, shivering accompanied by palpitation of the heart and an overwhelming fear of sudden death.

These symptoms cleared up under rest and ordinary care. A three days' journey some months later was apparently completed in good condition, for the patient had a good appetite and was so naturally fatigued as to get to sleep promptly. After a couple of hours of sleep, however, he was awakened with an extreme sense of terror. As before, the main element of this was an uncontrollable sense of impending death. The palpitation of the heart was so severe that he felt sure his heart would break and that he would instantly die. A careful examination of his heart by medical consultants made afterward showed that there was absolutely no heart lesion. All the consultants agree that his symptoms were due entirely to the nervous condition induced by the emotional strain of automobiling, while the crisis of the case was brought on by acute nervous indigestion. The patient was advised to give up automobiling, and since then has had no recurrence of these attacks.

It is not only, however, as a result of automobiling, but also as a cause of certain of the phenomena of injudicious speeding in automobiles that nervous symptoms are to be brought to the attention of the medical profession. In the discussion before the Society of Hypnology and Psychology, reported in the November number, 1903, of the *Journal of Nervous and Mental Disease,* a number of medical experts testified that many of the reckless drivers of automobiles are really individuals who are under the influence of a sort of speed intoxication, until there is practically complete loss of self-mastery. Dr. Hachet-Souplet explains that the intense impressions which are borne in on a man by the consciousness of high speed entirely under his own control often carry him completely away, so that the worse side of his nature gains the upper hand, and combativeness, spitefulness and violence take the place of his ordinary qualities. Berillon suggests that there is a great analogy between the euphoria—the pleasurable sensations of speed and those produced by morphine. The sense of levitation that follows morphine is likely to be felt, particularly when traveling at high speed in the open air, and there goes with it constantly a lack of control of will power. Paul Magnin considers that the indulgence in speed is not unlike indulgence in tobacco or alcohol. It is an individual affair, and, as is well known, many persons are unable to keep from abusing these indulgences. Some are affected so as to be deprived of all power of moderation, even to the extent of losing their instinct of self-preservation.

It appears then that the new occupation of the leisure class may prove a fruitful source of study for the physicians of the twentieth century. In the meantime it would be well if precautions were taken as regards the physical and mental health of those who are permitted to drive automobiles on crowded streets, especially when the machines are of the twenty to forty horse-power type. There is more than a suspicion that some recent accidents at night have been due to defects of vision, or color-blindness, which prevented the drivers from realizing the dangers of excavations and obstructions guarded by red lights. It is clear that permission to drive such heavy machines should not be accorded to anyone who has ever exhibited any signs of mental disequilibrium, since it is almost sure that the excitement and mental strain of automobilism tend to bring on

the manifestations of lack of control so that even healthy persons find it hard enough to retain their true mental balance.

As with regard to nearly every other important innovation in modern life there is a medical side to automobilism, a question involving danger of loss of life and limb that has been very calmly ignored. So far, in this country, we have had but few reports of the neuroses caused by and consequent upon automobiling at high speeds. It cannot be that American physicians have been without experience. It is more probable that their attention has not been seriously directed to the conditions but that now we shall hear more of them.

THE TYPHOID COST OF THE PHILIPPINES.

ALL of our experiences with wars and campaigning outside of our own territory have cost us dear in deaths from diseases brought home, and distributed by the returning soldiers. During the Spanish-American war the unfortunate conditions that developed in the camps even at home proved serious by giving opportunities for the wide distribution of typhoid germs.

It is probable that some of the malaria of recent years, in districts formerly little affected by its germ, has been due to the same cause. Relapses of malaria are not uncommon in the spring-time and so the mosquito gets the chance to become inoculated by the malarial parasites and to spread them in a region never before infected. The epidemic of smallpox which occurred in this country during the two years following the Spanish-American war was undoubtedly due to the importation of this disease by the campaigners from Cuba and Porto Rico and its transfer to many parts of the country by these discharged soldiers. This has already cost many thousands of lives and the end is not yet.

During the last three years there has been a noteworthy tendency to outbreaks of typhoid fever which did not exist for at least a decade before the Spanish-American War. From a large number of the smaller towns throughout the country have come reports of the existence of typhoid fever in epidemic form. At least four university towns have been badly frightened by the presence of typhoid and one of them suffered severely from the ravages of the disease. There is a general feeling of insecurity with regard to typhoid that probably portends the occurrence of further epidemics in the near future. We now know that typhoid fever is not the result of unsanitary conditions in general, or even of the contamination of drinking water by sewage, or by excrementitious material from human beings unless those human beings have been suffering from typhoid fever. Unless the principle that typhoid fever never originates *de novo* is true, that is, unless there is an absolute connection of any given case with a preceding one of the disease, all our modern bacteriology is founded on a false assumption.

It is evident that a large number of scattered foci of typhoid fever have somehow come into existence in this country and that it is from these that the specific germs succeed in finding their way into drinking water or into milk or other food materials to cause the disease in new subjects. The only possible cause for this renewed activity and widespread distribution must be some special opportunity for infection incurred by many individuals in different parts of the country. The ideal opportunity for this unfortunate process has evidently occurred in the Philippines. Typhoid fever has been commonly epidemic there and during the last two years, many hundreds of discharged soldiers have returned to their homes in the smaller towns throughout the United States, while, probably, still the hosts of typhoid bacilli. It is possible at times that the attack of the disease during their campaigning may have been so slight that in the tropical climate, with the liability to passing fevers among the unacclimated, the affection may have been unrecognized. Furthermore in abortive attacks of typhoid fever, we do not know how long the patient's stools may continue to contain typhoid fever germs. We know that the urine has been shown to be infectious from the presence of typhoid bacilli for many weeks and sometimes for months after convalescence from the disease has been fully established.

It is very evident that, to the calculated cost of our new possessions in treasure and in soldiers there must be added the fatal results of these epidemics at home. The only possible advantage to be derived from the present unfortunate situation is to see that the lessons of these epidemics shall not be lost. We are now made sure that the length of time during which a convalescent from typhoid fever may continue to be a source of infection for others is indeterminate. The fact that typhoid baclli may remain absolutely latent in the bone-marrow for many years after an attack of typhoid fever and then after the immunity fol-

lowing the original attack has passed off again become a source of danger, shows that there is much yet to be learned in this matter.

Another and even more important lesson is that the government shall take special care that returning soldiers may not prove sources of infection. It would seem that soldiers should not be allowed to go directly from foreign countries to their homes, but that their transfer to this country should be made some months before their discharge in order to be sure that the possibilities for the conveyance and distribution of infection to others shall have disappeared before they return to civic life.

The recent experiences in this country have taught us that war still remains a serious source of disease. Before the Spanish-American war it was thought that the development of sanitary science had reached a point that would enable the army medical department to preserve soldiers from epidemic disease. The idea was a complete illusion. The medical history of this country since the war, shows the necessity for precautions after men have been assembled in large bodies in tropical and unsanitary climates and must eventually add another chapter to the science of military hygiene. Let us hope that the lessons thus afforded shall not be neglected on the assumption that these calamities are due to other causes and not to the perfectly corrigible elements in our present conditions as an expanding nation.

ECHOES AND NEWS.

NEW YORK.

Bacteriologist to the Orange Hospital.—Dr. Ellen L. Lowell, of New York, has been appointed chief bacteriologist at the Graves Pathological Laboratory of the Orange Memorial Hospital. She will have entire charge. Dr. Lowell is a graduate of Leland Stanford University, and received her degree of M.D. from Johns Hopkins University. She is a member of the noted Massachusetts Lowell family.

Physician Hurt in Runaway.—Dr. N. E. Landon, of Newark, N. Y., one of the best known physicians in Central New York, was seriously injured on Christmas day in a runaway accident. He was riding behind a team of young horses when they became frightened at the cars and ran away. The doctor was thrown out and severely cut and bruised about the head and face. Medical assistance was summoned from this city, and it is believed that he will recover, although he is in a very serious condition.

New York's Low Death Rate.—Dr. William H. Guilfoy, Registrar of Records of the Health Department reports that the percentage of deaths will probably be found to be 18.15 for each 1,000 of the population. The estimated total deaths from all causes in the greater city for the year was placed by Dr. Guilfoy at about 67,000. The percentage for the year 1902, the lowest recorded up to that time, was 18.75. The union of all the boroughs into the greater city, he said, tended to lower the average of the death rate, because the rate is always higher in Manhattan and the Bronx than in the outlying boroughs. Dr. Guilfoy admits that not all the credit of the low death rate is due to Commissioner Lederle's administration of the department, efficient as that had been, adding: "It is in a great measure the fortunate dispensation of the power which rules the weather, and which holds the prevalence of diseases in check. The last two summers were remarkably cool, for example, very much decreasing the death rate among infants."

Medical Examination in Squadron A.—The following questions were asked the candidates for promotion as medical officers of Squadron A, by the headquarters examining board at its recent session. The board consists of Colonel George R. Fowler, of General Roe's staff, the Surgeon-General of the State of New York, Major Henry P. de Forest, Surgeon of the Thirteenth Regiment, Heavy Artillery, and Lieutenant Albert F. Brugman, Surgeon of the Second Battery, Light Artillery:

Anatomy.—(1) Describe the surgical anatomy of the carotid artery. (2) Describe the shoulder joint. (3) Describe the motor area of the brain.

Surgery.—(1) Discuss the question of probing in gunshot wounds of the abdomen. (2) Describe the symptoms and surgical treatment of obstructive jaundice. (3) A soldier in action receives a fracture of the femur in its middle third. Describe an improvised splint to be used in the field, and then the best appliance to be used when he reaches the permanent hospital.

Materia Medica.—(1) Name the principal alkaloids of opium, belladonna and of nux vomica. Give dosage of each. (2) What is the dose and composition of salol? (3) Write a prescription for the mixed treatment of syphilis.

Practice.—(1) Describe somewhat in detail the treatment of uremic convulsions. (2) What cardiac symptoms arise from the overuse of tobacco? How would you treat these? (3) Mention the principal respiratory diseases to which soldiers in camp are subject. Describe in detail the symptoms, diagnosis and treatment of one of them.

Camp Sanitation.—(1) Describe the location, construction and care of latrines in an army camp. (2) Describe in detail the best method of caring for kitchens and garbage in camp. (3) What camp diseases are in great measure due to pollution of the water supply and what means of prophylaxis should be employed?

Dr. Russell Bellamy was the successful candidate and has just been commissioned Captain and Assistant Surgeon of Squadron A, N. G. N. Y. He has been a member of the squadron for eight years, and was a private in Troop 2 for three years.

Pneumonia Epidemic in New York.—Dr. Herman M. Biggs, medical officer of the Department of Health, is making a careful study of the steady growth of pneumonia in this city. One result has been the adding of the disease to the list of those which must be reported to the bureau of contagious diseases as communicable. The records of the department show considerable increase in the number of cases of pneumonia this year over last year. In the week ended Nov. 28, last year, there were 116 cases; this year in the corresponding week there were 164 cases. For the week ended Dec. 12 there were 172 cases, against 105 last year. For the week ended Dec. 19 there was an increase of 68 cases over

the corresponding week of last year. Pneumonia increased its number of victims to 272 during the week which closed Dec. 28. This is the record for any one week in the history of the greater city, as it exceeds by three the number of deaths recorded last week from the disease. During the corresponding week last year 216 deaths from pneumonia were recorded, and that was then regarded as an unusually large number.

"We look," said the Registrar of Records in the Health Department, "for a lessening of the number if the present weather conditions continue. The deaths this week are further confirmation of the theory that pneumonia is an infectious disease, as in the previous weeks the thickly populated and crowded sections show the greatest number of deaths. The public should be especially careful during the present epidemic to avoid colds and to use every possible means to preserve the general health."

PHILADELPHIA.

Entertainment of Dr. Woodhead.—During his stay in this city, Dr. G. Sims Woodhead, of England, who delivered the third in the series of lectures under the auspices of the Phipps Institute, was entertained by several of the prominent physicians. On Saturday evening Dr. Joseph McFarland gave a dinner in his honor at the Bellevue Hotel. On Monday Dr. W. M. L. Coplin entertained him at luncheon at the University Club and in the evening he was given a dinner at the Rittenhouse Club by Dr. J. H. Musser. A reception followed the lecture on Tuesday evening and on Wednesday Dr. Ravenel, whose guest the distinguished visitor has been, gave a reception in his honor.

New Test for Pharmacists.—A decided innovation will be made by the State Pharmaceutical Board at the next examination which will be held in this city January 16. In addition to the usual written examination those applying for pharmacist's certificate will also be obliged to pass a laboratory test. Those applying for the certificate of qualified assistant will be given only a written examination as heretofore. The entire board will attend as the examination will be held only in the one city instead of at Pittsburg also as has been the custom formerly.

Drug Trust to Raise Prices.—The Philadelphia Association of Retail Druggists will after January 1 put into operation its new price schedule for proprietary articles. During the past year efforts to obtain full prices for ten-cent goods have been so successful that efforts will be made to secure the same scale for 25 and 50-cent articles. Several of the largest dealers have refused to join the association and persist in selling goods at their own price. Attempts on the part of wholesalers to refuse to supply them with goods have been met with threats of resorting to legal redress and the trust has been obliged to proceed very cautiously.

Physicians Asked to Aid in Stamping Out Smallpox.—Director Martin has sent a copy of the following letter to each physician in the city: "The conditions in Philadelphia are such as to threaten a grave epidemic of smallpox. Can you help in the preventive work by urging upon your patients and all the members of their households immediate vaccination of all unvaccinated persons, of all children over 12 who have been vaccinated successfully in infancy, of all adults who have not been vaccinated successfully within the last five years?"

Pathological Society.—The annual exhibition meeting of the Philadelphia Pathological Society will be held on the evening of January 14 in the Mutter Museum of the College of Physicians. Gross and microscopic specimens of all departments of human and animal pathology will be on exhibition.

Railway Accidents During 1902.—During the year ended June 30, 1903, a total of 26,503 persons were killed or injured on the steam and street railways of Pennsylvania. Of the passengers carried on steam cars 98 were killed and 2,713 injured; among the employes 1,323 were killed and 14,059 injured; of other persons 2,298 were killed and 2,716 injured. These figures show, as compared with last year, a reduction in the number of injured of 3,292; an increase in deaths of 446. On the street railways the killed and injured were as follows: Passengers, 41 and 1,727; employes, 21 and 252; other persons, 165 and 1,090.

CHICAGO.

New Buildings for Dunning.—The County Board of Commissioners has decided to erect at Dunning, Ill., a cottage for working patients, as well as a new morgue and pathological laboratory. A children's building will also be erected at the Cook County Hospital.

Children's Department for Provident Hospital.—A Children's Department has been established by this institution. The patients will be cared for by the colored nurses. In connection with this department a clinic has been instituted on Tuesdays and Fridays, from 2 to 4 P.M.

Appointment of Dr. Charles Whalen.—The appointment of Dr. Whalen to the Cook County Hospital has been approved by the Board of Commissioners of Cook County. Dr. Warren H. Hunter has been reappointed as County Physician, and Dr. V. H. Podstata has been reappointed as Superintendent of the Cook County Institutions at Dunning.

Cook County Hospital.—It has been suggested that the Council of the Chicago Medical Society take up for thorough discussion the present mode of appointment and of organization of the attending staff of the Cook County Hospital, with the ultimate object of securing for this important institution the advantages of a more permanent and more definitely organized staff than is possible under the elastic system hitherto in vogue. Every high-minded medical man in Cook County has looked forward to the time when the County Hospital will be in the hands of an attending staff organized according to the best ideals, and it is believed that the time is now ripe for an earnest, united effort of the recognized Medical Society of Cook County toward that end.

Influence of Weather Conditions on Mortality.—According to the bulletin of the Health Department for the week ended Dec. 19, 1903, the influence of the weather conditions of the last three weeks or so is already being reflected in the bills of mortality. The death rate for the week is 12.5 per cent. higher than that of the previous week, and very nearly as high as the average December rate of the previous ten years. An analysis of the figures in the statement of mortality indicates clearly that the weather and exposure to it at football games, during the street-car strike, in Christmas shopping, etc., is made responsible for the injuries. Thus, there is a 22-per-cent. increase in the deaths among the aged—those over sixty years. Deaths from the chronic diseases show increases of 10 per cent. each for consumption and heart diseases, of 11 per cent.

for Bright's disease, 65 per cent. for diseases of the nervous system, and 90 per cent. for cancer. The death rate may be expected to increase during the remainder of the month, and those suffering from common colds, catarrhs and similar slight affections of the respiratory system, all of which are almost epidemically prevalent, should exercise more care to prevent the development of tonsillitis, consumption and pneumonia. "Better secure medical attention now than later on in a sick bed," is the advice given by the Department.

GENERAL.

London's War on Rats.—The rat killers report satisfactory progress in their war against the rodents of the London docks. They have killed over 5,000 every month this year. The campaign opened when London had its bubonic plague scare and since then more than a quarter of a million of rats have been put to death. Aside from health considerations, this elimination is commended by the press of London on the ground that rats do an enormous amount of damage in the dock warehouses.

Meeting of Scientists in St. Louis.—The fifty-third annual meeting of the American Association for the Advancement of Science occurred in St. Louis during the present week, with between 700 and 1,000 members present. The first day's session consisted of addresses of welcome and responses. Dr. Ira Remsen, retiring president, called the meeting to order and introduced his successor, Carroll D. Wright. David R. Francis made an address of welcome. Dr. Remsen delivered a fine address on "Progress and Science." As is the custom, the Association was subdivided into nine sections and in these the most interesting work of the session was done.

Arsenical Poisoning in England.—There are some disquieting statements in the report of the Royal Commission on arsenical poisoning, which has been investigating all the circumstances of the extensive and fatal beer poisoning in the English midlands in 1900. It says that the number of persons who suffered was certainly 6,000, and probably considerably greater. Seventy deaths are known to have occurred; but it is believed that a large number of deaths certified as due to chronic alcoholism, cirrhosis of the liver, Addison's disease, or to "alcoholic," "peripheral," or "multiple" neuritis, were really cases of arsenical poisoning occurring before the nature of the epidemic was discovered. It is incidentally mentioned that the period of prevalence of poisoning was attended by a marked diminution of the birth rate in the localities chiefly affected. The report adds that there can be no doubt that a considerable proportion of the beer brewed in some parts of England before 1900 contained noteworthy quantities of arsenic, mainly derived from malt and from brewing sugars, and that the amount derived from malt must have varied greatly in different places. Malt had been shown to be subject to arsenical contamination from the fuel used in the drying kiln, and in a much greater degree when the fuel was gas coke than when other forms of fuel, such as oven coke or anthracite were employed.

Insanity among American Indians.—At the close of the first year's existence of the National Hospital for Insane Indians, at Canton, S. D., the first data ever collected about Indian insanity indicate that forced civilization is responsible for much of it. In its first year half the capacity of the hospital has been taken up by 34 inmates. In a few months the remainder of the rooms will have been taken, and additions will be necessary. But there will still be at large many Indians hopelessly insane, and it is believed that the ratio of insanity will undoubtedly continue to grow. Supt. O. S. Gifford and Dr. J. F. Turner, assistant superintendent and physician of the hospital, agree that the chief cause of insanity among Indians is despondency. Just as with the whites, brooding over troubles and disappointment undermines the Indian mind quicker than anything else. This is manifested in different ways, but most of these manifestations would have been improbable or impossible in the former wild life of the Indian. That brooding should follow when the Indians cannot have the employment of hunting or making visits at a distance and are even prohibited from indulging in their native dances is natural.

Moral Deficients among Children.—The theory of Dr. Still of London that evildoing in children is not "naughtiness" but "moral imbecility" has presented an absolutely new problem to the mothers of Great Britain. It must not, however, be supposed that every phase of infantile peccadillo must be labeled as due to "morbid moral defects." The whole question is purely one of degree. Broadly speaking, the ordinary so-called naughty child is not for the moment, at any rate, worthy of high-class medical consideration. On the other hand, the abnormally naughty child is by a consensus of scientific opinion to be considered as "morally deficient." In the opinion of another physician of wide experience children fell into two groups—the normally naughty and the abnormally naughty. Luckily, the abnormally naughty form a very small minority. He first cleared the ground by saying that children are not born with moral tendencies. The child of three years of age is simply a victim of emotions. It has no morals, but as time goes on accumulated accidents give it experiences which lead it to choose between wrong and right, even upon the lowest possible ground—that right pays and wrong does not. During the growth of some children, however, it is seen that they are not influenced by considerations of this kind. It may be shown in the most subtle way, or it may be perfectly plain to every one. The fact remains that they are not induced to do right by punishment. The difference in some cases is so slight in childhood that the doctor was certain that a large number never showed this taint sufficiently to call for any special comment, but when they grew up and restraints were removed they developed into criminals. One of the great difficulties in dealing with these children was the absence of these special signs, and in view of this the doctor acquiesced in the opinion of Dr. Still that all that could be done was to watch carefully and adopt a system of segregation.

British Cancer Research Fund.—The work of the British Cancer Research Fund, which is now well under way in its laboratories on the Victoria Embankment, London, and at an experimental farm in the country has been divided into four general subdivisions: (1) The experimental work on animals consists of a study of the malignant growths occurring spontaneously among them, and tests as to the possibility of successful inoculations with human cancer. It has already been established that cancer is extremely prevalent among domestic animals, dogs, cats, horses, cows, and pigs being especially prone to it. The inoculability of cancer from one animal to another has been accomplished, thus justifying the claims of several previous investiga-

tors. Experiments are now under way on the farm to determine the rôle which irritation plays in causing cancer. (2) The microscopic work consists of a study of the structure of malignant tumors in the light of their clinical history. Specimens are received from the London hospitals, from hospitals in the British colonies, and arrangements have just been completed for an exchange of specimens with institutions in the United States, France, Germany, Norway, and other countries. It is hoped in this way by keeping in touch with other laboratories to avoid the repetition and resulting loss of time of special lines of research in various parts of the world. (3) The statistical work compares and correlates the facts regarding the occurrence and mortality of cancer in various regions. The figures thus far collected seem to indicate that the alleged increase of cancer is apparent rather than real and is accounted for by greater accuracy in diagnosis. (4) Treatment. In this section the various remedies and proposed "cures" are tested. Thus far the experiments on the various light cures—Finsen, X-ray, radium, etc., indicate that they act simply as caustics. In the case of superficial rodent ulcers, considerable success has attended the use of X-rays. A study of the results obtained by the use of radium does not inspire much hope of its therapeutic future. Regarding a cancer antitoxin, it is stated that a formidable and practically unsurmountable obstacle is the lack of knowledge regarding the cancer toxin, or poison. Until this is obtained, the search for a curative serum is entirely in the dark. The fund still lacks $100,000 of the $500,000 capital which it was calculated would be required to maintain the laboratories. There seems no way in which money could be more usefully spent by wealthy persons for the benefit of mankind. No disease causes more terrible suffering, both mental and physical, and its victims are usually taken at the most productive period of life. The work at the London laboratories is international in scope, and deserves the support of all who can afford to give.

Carnegie Institution and Its Appropriations.—During the year just closed the Carnegie Institution, with its headquarters at Washington, has appropriated liberally to a wide range of scientific investigation. While a large part of the funds distributed by it has gone to researches in astronomy, geology, anthropology, etc., assistance was given to those branches of science more closely correlated with medicine as follows: W. O. Atwater, Wesleyan University, Middletown, Conn., $5,000 for experiments in nutrition; Arthur Gamgee, Montreux, Switzerland, $6,050 for a report on the physiology of nutrition; E. B. Wilson, Columbia University, New York, $1,000 for investigations in experimental embryology in Naples; Marine Biological Laboratory, Wood's Hole, Mass., $10,000.

OBITUARY.

Dr. SAMUEL WOODCOCK, of Manchester, England, died of apoplexy on December 12, 1903, at the age of sixty-four years. Dr. Woodcock was a prominent member of the British Medical Association and a forceful worker in all that pertained to medical politics. He was active in the reconstitution of the association, took a prominent part in framing the Midwives' Bill and many other medical acts that have become English laws.

Dr. DANIEL EMBURY KISSAM died at his home, at Huntington Harbor, Long Island, December 24. Dr. Kissam from 1848 to 1888 practised as a physician and surgeon in Brooklyn. He was a native of New York City, and was born Oct. 3, 1817. He was visiting surgeon to the Brooklyn Hospital, and perfected many contrivances for surgical operations. During the Civil War he volunteered as a surgeon and went to the front.

Dr. HUGH M. WALLIS, a leading physician of Terrebonne parish, La., died at Covington, La., December 27. He was sixty-nine years old, and a native of Kent county, Maryland, but a resident of Terrebonne for forty-one years. He was Mayor of Houma for several terms, Coroner of Terrebonne parish and owner and editor of the Houma *Times*.

WILLIAM NEWMAN, M.D., F.R.C.S., died in the Stamford Infirmary, England, in the seventy-first year of his age. Dr. Newman was for years one of the best known surgeons in the Midlands and held important offices in the British Medical Association.

Dr. WILLIAM H. A. YOUNG, one of Springfield's best-known physicians, was shot through the heart last Tuesday afternoon by a bullet from his rifle, which he was placing in his carriage previous to going hunting. The fatal accident took place just inside the stable doors, which were open, and was witnessed by his wife and several friends who were visiting in the home.

Dr. AUGUSTUS D. RUGGLES of 330 West Fifty-sixth Street, died December 27. He was sixty-three years old, and was graduated from the University of Pennsylvania in 1862. He was a member of the New York Physicians' Mutual Aid Association.

Dr. ROBERT BOOCOCK died at his home, 2,905 Clarendon Road, Brooklyn, on December 28. He was born in York, England, in 1833, and came to this country thirty-three years ago. He was a physician of the homeopathic school, and was also for many years an ordained minister in the Baptist Church. For the past twenty years Dr. Boocock confined himself exclusively to the practice of medicine.

SOCIETY PROCEEDINGS.

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Sixteenth Annual Session, held at the Piedmont Hotel, Atlanta, Ga., December 15, 16 and 17, 1903.

The President, J. Wesley Bovée, M.D., Washington, D. C., in the Chair.

An address of welcome was delivered by Mayor Evan P. Howell, which was responded to by Dr. George Ben Johnston.

Study of the Prostate and Treatment of Prostatic Hypertrophy.—Dr. G. Wiley Broom, St. Louis, Mo., exhibited a number of hypertrophied prostates that he had removed. The author said that he had made approximately two hundred post-mortem examinations to investigate the condition of the bladder and prostate in each subject. He said it was generally believed by routine prostatectomists that all prostates had a capsule, but this was not true. His conclusions were (1) The position of the urethra in the normal state was always in the floor of the bladder; but in urinary obstruction it was always elevated from an inch to an inch and a half or two inches above the floor of the bladder. (2) He took the position that normally there was no third lobe, but that segmentation took place behind the prostatic fissure in consequence of a hyperplasic process, this process occurring in the direction of least resistance —into the cavity of the bladder. (3) Only a small

percentage of cases of hypertrophied prostate was responsible for urinary obstruction. (4) No matter how large the prostate became, it would retain its functionating capacity. It was not the organ which caused suffering to the patient. (5) By prostatectomy this functionating organ was mutilated or destroyed, and the bladder, which really caused the patient trouble, was left *in situ* without any operation having been performed on it. (6) In only a small percentage of cases could the prostate be enucleated. (7) It was unfortunate that the profession had reached the point of resorting to routine prostatectomy in all cases of urinary obstruction. (8) The commissure and capsule were obliterated in the fibromyomatous variety of prostate. In the adenomatous variety, if complete and permanent drainage was established, the prostate would shrink.

Dr. C. H. Mayo, Rochester, Minn., had operated by the median perineal method in over thirty cases after the manner of the Goodfellow procedure, and had been much pleased with the method and results.

Dr. W. P. Carr, Washington, D. C., had never seen but one prostate where there was any difficulty in peeling it out of its capsule. Cases of hypertrophied prostate should be operated upon earlier, before the bladder became infected. Prostatectomy in healthy men had a very small mortality; but in those who had infected bladders, who had Bright's disease, or atheromatous arteries, it was a serious operation.

Dr. Broom, in closing, deplored the tendency to do routine prostatectomy regardless of the actual pathological conditions of the parts.

Edematous Encephalitis.—Dr. W. P. Carr, Washington, D. C., called attention to a condition of the brain that he had encountered quite frequently when operating for cerebral epilepsy and for suspected cerebral abscess following mastoid disease due to grip. This condition he called edematous encephalitis. It was apparently so much benefited by opening the skull and draining the excessive serum from the brain, that it deserved careful consideration. He reported four cases. It was impossible to say in most cases whether the edematous encephalitis was caused by injury or by the poison of influenza, or whether it was a lesion of epilepsy. He had not been able to find any cases in the literature in which edema was noted as a marked feature. In cases of severe cerebral symptoms following influenza or blows upon the head, where the symptoms persisted or became worse after weeks of medical treatment, he thought that exploration was justifiable in the hope of finding edematous encephalitis or some other condition that would be benefited by operation. In operating for edematous encephalitis he recommended that a large osteoplastic flap be cut with the De Vilbiss craniotome over the site of any injury that might be suspected as a cause, or over some location indicated by the symptoms. If the symptoms furnished no local indication, and there was no local injury, then the flap had best be turned down in a convenient place, say the upper parietal region. The exposed membranes and brain substance should be examined carefully, and if they presented an edematous appearance, a grooved director should be introduced into the brain substance carefully in several places, and the serum drained off until the brain assumed a normal appearance. A small soft drainage tube should be inserted just through the dura into the arachnoid space and left in place as long as there was a copious discharge of serum. This tube might be brought out through one of the small trephine holes made for the introduction of the De Vilbiss instrument, and stitched to the skin after an osteoplastic flap had been replaced. If the head was carefully shaved and scrubbed, and all proper antiseptic precautions taken, this operation was almost free from danger; and if only a small percentage of the serious cases could be cured in this way, the operation would be justifiable. He had been encouraged by his limited experience to believe that surgeons might hope for recovery or great improvement from this operation in many otherwise hopeless cases of epilepsy and of progressive brain disease due to trauma and influenza.

A New Device and Method for Intestinal Anastomosis.—Dr. W. P. Carr said he had devised a method of intestinal or gastro-intestinal union by small silver clamps which he thought were more easily and quickly applied, and that had none of the objectionable features of the Murphy button. The clamps were exhibited. The method consisted in clamping the inverted edges of the gut from the inside, in the manner indicated by drawings which were passed around by the author. The clamps will hold well and make an air-tight closure. They were applicable to any sized intestine or wound. They left a large opening in the lumen of the bowel, and passed out as easily as watermelon seeds. The edge and corners of the clamps were smooth and rounded. They had small teeth to prevent slipping, made by simply indenting the metal; but these teeth were not long enough to pass through the entire thickness of the bowel. The clamp might be applied with any suitable flat broad forceps, but it was better to have a forceps with a slight ridge to keep the clamp from slipping. He had used these clamps in one case of resection of five inches of gangrenous ileum caused by strangulated hernia. The man recovered, and most of the clamps were recovered between the sixteenth and twenty-first days.

Dr. C. H. Mayo said he and his brother (Wm. J.) had operated on many cases of epilepsy and traumatic insanity, and he could corroborate what the essayist had said regarding edematous encephalitis. Treatment by drainage came the nearest to the solution of affording this class of cases relief.

Dr. I. S. Stone, Washington, D. C., mentioned a case, in referring to Dr. Carr's device, in which gastro-enterostomy was performed about a year ago, with the aid of the Murphy button, but the button had not yet been passed. In another case of diverticulum with obstruction the button was used, but the woman was still carrying it with some anxiety. Thus far, however, there were no symptoms of intestinal destruction from the retention of the button. He complimented Dr. Carr on the ingenuity and originality of his device, and said when an opportunity presented itself he would use it.

Dr. Guy L. Hunner, Baltimore, Md., objected to the use of all mechanical devices and favored suturing the intestine; although he thought the simple device exhibited by Dr. Carr would enable surgeons to do intestinal anastomosis rapidly.

Dr. J. Garland Sherrill, Louisville, Ky., advocated suturing the bowel in preference to the use of all mechanical devices. In his intestinal work he preferred silk.

The Surgical Physiology of the Lymphatic System.—Dr. C. H. Mayo, Rochester, Minn., said that a study of the lymphatic system readily explained many normal physiological as well as pathological processes. The subject was deservedly receiving more attention from surgeons who now generally recognized that aside from acting as the general absorbent system, it was constantly engaged in maintaining nutrition as well as defense against pathological processes. All tissues were provided with lymph vessels and glands in direct proportion to their exposure, activity and necessity for repair. The tissues of the body were constantly bathed in lymph, which fluid, similar to and derived from the

blood plasma, must all pass through the lymph vessels and glands. In the glands the lymph was exposed to the direct action of the leucocytes which were there found in great abundance. It was in the glands that infection was checked, and destroyed, or it might possibly overpower the gland and develop local growth. An enlarged gland was an evidence of a local struggle and defeat. The lymph system undoubtedly performed a great function in draining the ductless glands. Considering the lymph supply of certain organs, it was found that the brain was deficient in lymphatics in its structure, the arachnoid serving this purpose upon its surface. Hemorrhages into its structure became cysts from lack of absorption and infections in its substance caused but little temperature or general disturbance except from pressure. The liver and kidney showed the same condition in a less marked degree. The lungs, rich in lymphatics, gave constant temperature from infectious diseases. Chills usually signified the direct delivery of accumulations of infection into a vein. In certain diseases resulting from a loss of equilibrium between the production and absorption of fluids, one set of lymphatics was substituted for another by operation, as in glaucoma and hydrocephalus. When lymphatic conditions were considered in connection with surgical work, it was found that there was a real principle involved in drainage, whether it be internal or external.

Varieties of Drains and Drainage Adjuncts.—(1) Rest by splints, pressure, dressing or bed, to quiet the circulation; (2) by elevation to reduce arterial supply and favor venous and lymphatic return; (3) by massage to break up coagulated exudates and enable the lymph vessels to remove the exuded material; (4) moist dressings favor the escape of exudate from open wounds and also favor the lymphatic circulation in closed injuries; (5) adjuncts to drainage in the use of solutions having affinity for moisture acting by osmosis as glycerine or alcohol; (6) wound drainage could be accomplished by the open method with or without secondary suture; (7) by separate incision; (8) by wicks, capillary or tubular drains, or gauze packs, as mechanical aids.

Early Diagnosis of Cancer of the Uterus.—Dr. F. F. Simpson, Pittsburg, Pa., said the great body of the medical profession saw but a single case of cancer during the time they were treating hundreds of other afflictions, and naturally looked upon that malady as being relatively rare. As a malady, it was infrequent; but as a cause of death its frequency was appalling. Early in 1900 a note was addressed to the health departments of American cities with an aggregate population of ten million, requesting a tabulated statement of deaths from cancer and from all causes during each year of the preceding decade. Statistics showed that of every fourteen people who reached the age of thirty years, cancer would claim one as its victim. Bearing more directly upon the subject of cancer of the uterus, however, was the distressing fact that of every 28 women who passed the age of thirty years, one would be the victim of this disease. The paper was largely statistical, and the author closed by saying that the day was fast approaching when well-informed women of the cancer age would seek protection by regular quarterly examinations. Early diagnosis would then be the rule in cancer of the uterus as it was in appendicitis to-day.

Fracture—Dislocation of the Spine.—Dr. J. Shelton Horsley, Richmond, Va., reviewed the opinions of several authorities on the treatment of this lesion. He recommended that in treatment individual judgment should be used as in other surgical operations. He emphasized the similarity between injuries of the spinal cord and injuries of the brain so far as treatment was concerned, and called attention to the fact that without an operation or a post-mortem examination it was impossible to tell by symptoms alone when the cord was completely destroyed. He advocated the plan of McCosh, to operate in all cases of complete paralysis below the injury unless there was improvement within twenty-four hours after the injury. When the trauma was especially marked, he operated sooner. He pointed out that the danger of delay lay in degenerative changes in the spinal cord which set in soon after the injury. Early operation might arrest this degeneration. He reported six cases, in two of which the injury was received several years before he saw the patient. In one there was a forward dislocation of the axis and atlas from the third cervical vertebra. This was demonstrated by an X-ray picture. The patient had paralysis of the muscles of the arms, body and thighs. There were disturbances of sensation of various degrees over the body and limbs. He reported two other cases in which fatal results rapidly followed the injury. One was from a gunshot wound, and the other was the result of a fall on the shoulder in which there was a fracture-dislocation in the lower dorsal region. The last two cases he operated upon, in one there was an injury at the lower dorsal region where the whole of the dorsal spinal column was dislocated forward upon the lumbar spinal column. The spinous process of the last dorsal vertebra was fractured. The cord was caught between the last dorsal and the first lumbar as between the blades of a pair of scissors. It was not completely crushed as the dislocation was not extensive enough. It was impossible at the operation to reduce the dislocation, so the spinous processes and the laminæ of the last three dorsal vertebræ were removed. This relieved pressure on the cord. The patient died, however, from pneumonia a week later without any improvement in the spinal symptoms. A post-mortem examination showed the wound in an excellent condition, with the cord softer than at the time of operation, and solidification of the whole lower lobe of the right lung, and a part of the middle lobe. In the other case operation was undertaken about a month after fracture of the eleventh and twelfth dorsal vertebræ in a laborer, nineteen years of age. The cord was almost completely gone, there being a few fibers remaining from its anterior portion. The laminæ had been fractured and driven into the canal. One of the articular processes had also been driven into the canal. These were removed, and the wound closed, leaving a small catgut drain. There was no decided improvement in his condition for six weeks after the operation. At this time he urinated voluntarily; two weeks later there was noticeable improvement in both sensation and motion in the thighs. This improvement continued until the present, about three years after operation. His thighs were practically normal as to motion and sensation. Bladder and rectum acted naturally, and his general health was excellent. He could stand with support and walk by having a strong support on each side. His legs and feet were still paralyzed both as to motion and sensation. At present patient weighed nearly two hundred pounds, and was quite comfortable, except for occasional pains in his legs.

Neoplasms, Wherever Situated, Should, if Possible, Be Removed, Whatever Their Apparent Nature.—Dr. Maurice H. Richardson, Boston, Mass., considered chiefly neoplasms of the breast and of the female pelvis in his paper on this subject. The reasons which justified the adoption of the title rule in these regions would apply with certain exceptions to all parts of the body. These reasons, all of which were illustrated by

specific cases, in the author's own experience, were as follows: (1) The uncertainty of the diagnosis, even on the part of the most experienced and the most skilful, made palliative treatment hazardous, especially in the doubtful cases. Several instances were given in which the patient was not operated upon because the tumor was supposed to be benign when, in reality, it was malignant. The error cost the patient the favorable moment for operation. The impossibility of accurate diagnosis in even the most accessible regions of the body was emphasized. Breast tumors apparently benign had proved malignant. Breast tumors benign throughout their principal areas showed minute foci of malignancy. Breast tumors clearly benign had after many years developed a fatal malignancy. So in abdominal tumors, especially the pelvic tumors in women, the difficulties of diagnosis made the apparently benign cases especially dangerous. Many instances were given illustrating the difficulties of diagnosis and the necessity for exploration in even the most favorable cases of presumably benign growths. (2) The dangers of benign tumors becoming in time malignant was emphasized and illustrated by not a few cases in which after years of slow and harmless growth a tumor had suddenly developed evidence of malignancy. Tumors of the breast, of the gall-bladder, the stomach, the uterus, the ovary, and of other regions, had by an acquired malignancy convinced the speaker that the only safe rule of treatment was in all cases thorough extirpation of the tumor as early as possible. (3) The wisdom of exploration in certain apparently hopeless tumors was illustrated by cases in which a benign and easily remediable condition was found, and in which impending death was averted by a safe operation. In this class were infiltrating tumors of the abdominal wall supposed to be hopelessly malignant, but which proved to be tuberculosis of the muscle, aponeurosis; epigastric tumors, apparently cancerous, found to be pancreatic cysts, actinomycosis, chronic pancreatitis, and the like. Pelvic tumors supposed to be malignant and inoperable were proved to be old tubal inflammation, fibroids, ovarian cysts and the like. (4) The essential malignancy of certain areas in the malignancy-inviting nature of certain regions, especially the breast and the ovaries, was especially emphasized. In these regions the tendency of tumors to become malignant made the application of this rule practically imperative. Ovarian tumors, even when apparently benign, were shown to have especially dangerous tendencies to malignant degeneration. (5) In pelvic tumors especially, the benign often masked the malignant. Cases were reported to illustrate the obscuration of a uterine sarcoma by an overlying fibroid. In two recent cases cancer of the ovary was found concealed by an enormous fibroid, and in a third there was found an annular stricture of the sigmoid flexure. The rule of universal extirpation had numerous exceptions. It should not apply to superficial tumors, clearly benign, which could not be removed without great disfigurement; keloids that could not be removed without leaving a broad scar, unless they showed a tendency to ulceration and malignancy; all other benign tumors, which caused needless suffering, disability and disfigurement, whenever their removal was dangerous, or whenever the patient's general condition was unfavorable; and tumors of all kinds in which the dangers and sufferings of removal outweighed the dangers and sufferings of the tumors themselves.

Dr. Henry T. Byford, Chicago, said he belonged to the Chicago Academy of Medicine, whose motto was, "When you see a head, hit it." He thought this would fittingly apply to the removal of tumors as soon as they were seen. A year and a half ago he was called upon to diagnose a tumor in the pelvis about the size of the end of one's thumb, which was situated between the bladder and uterus. The attending physician said that this tumor did not amount to much, and argued against operation. The woman subsequently became pregnant, miscarried at the fifth month, the tumor at this time having attained the size of an egg. He thought it would continue to grow unless removed. No matter whether a tumor was going to become malignant or not, it was a foreign body and should be removed as soon as possible.

Dr. W. P. Nicolson, Atlanta, said early operation, when safe, was to be commended in every case. He related a case of sarcoma of the mesentery in which he had operated, with recovery of the patient. He also narrated a case in which a sarcoma sprang from back of the rectus muscle and infiltrated the whole pelvis. The tumor was removed, with recovery of the patient.

Dr. W. B. Coley, New York, stated that three years ago a patient came to him with a bad cancer of the breast. She had been under the observation of an eminent surgeon, who had been watching the tumor for a year at intervals, telling her not to have anything done until he thought she needed it. The tumor was finally pronounced cancer by this surgeon, but the patient consulted Dr. Coley with a view to having an operation performed. Careful examination disclosed all the characteristics of advanced cancer. An operation was done, but the disease returned within one year, from which the patient died. He thought these growths should be removed without waiting to determine whether they were malignant or not.

Dr. W. P. Carr said that one of the first tumors he had ever removed was a cancer of the breast in a girl of nineteen. He had no idea it was cancer at the time of its removal, but sections proved it to be such. This prompted him to examine all tumors, particularly those of the breast, and he was surprised to find that a great many of the tumors of the breast which he supposed to have been adenoma proved upon microscopical examination to be carcinoma. He thought if surgeons made it a routine practice to examine microscopically all the small benign tumors they removed, they would find many of them to be malignant.

Dr. J. M. Baldy, Philadelphia, said the more experience he had, and the older he became, the more he was convinced that the truly honest man would admit his inability to diagnose accurately many cases of tumors. He supported the essayist in saying that these neoplasms ought to be removed, no matter where they occurred. There were some tumors of the breast that were not malignant. He had removed a number of them, but he thought the vast majority were malignant. In the past year he had re-operated twice on cases of cancer that had been subjected to X-ray treatment, and in one he had operated a third time for the return of the disease after X-ray treatment, although the physician who had used the X-ray had said the patients were doing satisfactorily.

Dr. J. Shelton Horsley mentioned a case of cancer of the breast that was operated on. There was local recurrence, and the patient was treated by the X-ray. After two weeks' treatment with the X-ray the woman began to sink rapidly and soon died. Post-mortem examination disclosed extensive metastases in the brain, liver, kidneys, ovaries, heart, etc. The X-ray had no beneficial influence on this case.

Intestinal Cancer.—Dr. J. G. Sherrill, Louisville, Ky., in a paper on this subject stated that cancer of the intestine, while rare, was more frequent than physicians were led to believe; that sarcoma was much less frequent than carcinoma, and selected especially the small intestine, while carcinoma most often attacked the large bowel. The appendix was the seat of both carcinoma

and sarcoma, although occurring quite infrequently. The literature showed that men suffered from both forms oftener than women. Adeno-carcinoma was the type most frequently seen, while the round-celled sarcoma or the lympho-sarcoma occurred oftenest. The author reported two cases at length of cancer of the intestines. He said that the treatment was to be largely determined by the extent of the involvement. Resection of the intestine and extirpation of the growth offered the patient the only hope of a permanent cure, and this chance, though slight, should be given the patient whenever practicable, as early in the course of the disease as possible. Any of the classic methods might be employed.

Amputation of the Hip Joint for Sarcoma, with a Report of Seven Cases without Mortality.—In a paper on this subject, Dr. Wm. B. Coley, New York, said that the tumor originated in the bone or periosteum of femur in 5 cases, and in the soft parts in two. The age of the patients ranged between six and fifty-six years. In 6 cases Wyeth's pins were used, but in the seventh case the growth extended above Poupart's ligament; pins could not be used, and the external iliac artery was first tied. All of the patients made a good recovery from the operation; yet only one patient survived operation long enough to be called a cure. This was a sarcoma of the thigh in which the mixed toxins of erysipelas and *Bacillus prodigiosus* were used for two months before amputation. In one recent case the patient was still alive without recurrence; in all the other cases death occurred from local or general recurrence in from four months to two years after amputation. Of four other cases of sarcoma of the femur and thigh, treated by high amputation, just below the trochanter, two patients died at the end of four months; one died at the end of 2¼ years, and a third had recurrence in the gluteal region, which disappeared under the mixed toxin treatment, and the patient was alive at present without recurrence, six years afterward. The extraordinary malignancy of sarcoma of the femur was shown by the very small number of patients known to have survived for more than three years after amputation. Butlin was able to find but one case in 68 treated by high amputation or hip-joint amputation. Wyeth in 1901 collected 131 cases treated by hip-joint amputation with ten alive more than three years. Dr. Coley stated that he had personally known of but six cases. In one of these cases (Dr. Bull's) operated up sixteen years ago, a severe infection occurred in the wound, probably streptococcus, and the patient was well six years later. In another case (Dr. Gerster's) the disease was so extensive and so high up that amputation was considered impossible, and the patient was treated with the mixed toxins of erysipelas and *Bacillus prodigiosus* for several months. The tumor disappeared, and the patient was shown at the New York Surgical Society a year ago in perfect health, more than four years after treatment. The better results following amputation in the pre-antiseptic days the writer attributed to the infection that frequently occurred in the earlier period. This fact together with the results referred to, in which the erysipelas toxins were used, he believed sufficient reasons for advocating a systematic use of the toxins after primary amputation as a prophylactic against recurrence. He would not advise such treatment prior to amputation in sarcoma of the femur, on account of the great liability to early metastases, though in a case of sarcoma of the tibia he had been able to save the leg, and the patient was now well seven years afterward. The method of treatment advocated by Mikulicz, namely, resection of the femur, Coley did not think should be adopted as a substitute for amputation. While it was true a fairly useful limb might be obtained by resection, there were no cases treated by this method that had been observed for longer than a year, hence nothing could be said as to permanent cure. The X-ray, Coley believed, should never be used unless the patient absolutely refused amputation. One such case he had treated two years ago (round-celled sarcoma of femur); the tumor apparently entirely disappeared in the femur, but ten months later a large metastatic tumor appeared in the pectoral region, which was partially removed by operation. A little later another very large tumor appeared in the lumbar and iliac regions. Under long-continued treatment with the mixed toxins plus the X-ray, the tumors disappeared, and the patient was alive and well to-day, though by no means regarded as cured.

Diagnosis and Treatment of Gall-stones.—Dr. Mack Rogers, Birmingham, Ala., read a paper on this subject. After referring to the differential diagnosis, he spoke of the operation for the removal of stones from the gall-bladder, saying that where there were no adhesions it was a comparatively easy one, but when the stone was located in the common duct, or extensive adhesions existed, or both, the surgeon had a very difficult condition to deal with. In the hands of competent, experienced men he regarded this operation as one of the safest in the abdominal cavity. The mortality in all cases averaged only about three per cent.

Surgery of Urinary Tuberculosis in Women.—Dr. Guy L. Hunner, Baltimore, Md., reported 35 cases occurring in the service of Dr. Howard A. Kelly and his associates in Baltimore. These patients were all women with an average age at the onset of symptoms of twenty-eight years. The disease was unilateral in 31 of the cases, and it was probably primary in the kidney, as regards the urinary system, in 30 or more of the cases. Thirty-one cases had bladder symptoms at some time in the course of the disease, although only 18 cases had bladder lesions at the time of operation. Eleven of these 18 cases still had some bladder symptoms, and five were known to have bladder lesions, although 9 of the 11 had had systematic bladder treatment. Tuberculosis of the bladder did not heal with the ordinary methods of treatment, and if the disease persisted a year and did not occupy more than half of the bladder, it should be excised. Of 22 ureters examined microscopically, 17 showed tuberculosis, while 5 were chronically inflamed. If a tuberculous ureter remained either in part or *in toto*, the wound usually remained open at least two years, while the removal of the ureter with the kidney resulted in rapid closure of the wounds. Five cases died—three after six and eleven weeks, and two years, respectively, from involvement of the other kidney, and two, in fifteen and six days, because of the operation. Sixty-six per cent. of the patients were enjoying fairly good or excellent health.

Spurious Dysmenorrhea.—Dr. Henry T. Byford, Chicago, read a paper with this title in which he made a plea for a more rational treatment. After naming 25 varieties that were mentioned in the text-books, the author called attention to their disappearance therefrom. Many supposed cases were spurious in character. These had been perpetuated by the physician and cured by the quack. The absurdity of the nasal cure was emphasized and the cures referred to as spurious. Instances of menstruation in the male were quoted. The trend of the paper was to condemn writers for bringing the symptom into the foreground when it should be kept in the background, and for wasting their own time and that of their readers in ridiculous refinements and speculations.

Memorial Address on Dr. W. E. B. Davis.—Dr. Richard Douglas, Nashville, Tennessee, spoke eloquently and impressively of the work that had been accom-

plished by Dr. Davis, and pointed out in a masterly manner the distinguishing characteristics of the deceased.

Diagnosis and Treatment of Congenital Misplacement of the Hip in Infancy.—Dr. Albert H. Freiberg, Cincinnati, Ohio, had been able to ascertain that in several cases children with congenital misplacement of the hip had been late in walking. It was a common experience in mild grades of rachitis that children were late in walking. The usual age of sixteen months was passed by and the rachitic child not only failed to walk, but was usually also unwilling to stand. He had been able to ascertain in several cases and to observe in one that children with congenital luxation stood readily at the usual age for walking, and especially if allowed to support themselves by holding on to some object. It was only when independent effort at ambulation was urged that the child showed its timidity and refused to make the attempt as a normal child would. This period, of course, was gone through by every normal child, but in some cases its long continuance might be attributed to congenital luxation. The length of this period in luxation cases varied greatly, but in every case was finally determined by the child's learning to walk with more or less limping, at which time the diagnosis was usually made and was of no further interest in this connection. In some few instances mothers observed these things, and possibly also that the apparent breadth of pelvis and perineum was unusually great. It was, therefore, urged that in the presence of any of these signs which had been referred to, attention be paid to the possibility of congenital luxation, and that in the event of any doubt the X-ray be resorted to as a final means of precision. Experience had abundantly shown the feasibility of operative procedure after the age of one year, and that the results amply justified the great additional care which was necessary to prevent the dressings from becoming soiled in so young a patient.

The Progress of Ureteral Surgery.—Dr. J. Wesley Bovée, Washington, D. C., President of the Association, selected this title for his Presidential Address. After referring to the deaths of Drs. W. E. B. Davis, George J. Engelmann, and J. McFadden Gaston, he spoke on the surgery of the ureter, giving its history and present status. The treatment of ureteral calculi first claimed attention, since the diagnosis and treatment of this condition were very much studied at the present time. The employment of the X-ray was the simplest procedure known for purposes of diagnosis, and were it accessible at all times and completely reliable, no other method would be comparatively valuable. Unfortunately, such conditions as calculous anuria might render a patient in a secluded place so ill that this method of investigation was necessarily precluded. Moreover, calculi might be of sufficient size to block the ureter and give no shadow in the radiograph. For this reason especially, other plans of examination should be employed, although the necessity of constant manipulation of the ureter was a *sine qua non* to dexterity in treating other conditions of this structure. Palpation would ever have its important position. Exploration was an important method in such investigations. Tubular calculi might escape discovery by this plan. The wax tipped bougie, suggested and used by Kelly was especially sensitive, and no doubt if it touched a calculus it would receive a telltale impression. In the treatment of ureteral calculi the proper plan was extraperitoneal ureterolithotomy as infected urine was usually associated with this condition and easily produced peritonitis, if permitted to come in contact with the peritoneum. If pus was not present, the establishment of ureterocutaneous fistula would seldom be necessary, though careful drainage of the wound would be advisable. This rule applied to every part of the duct. He was firmly convinced the ureteral wound should be made longitudinally whenever possible, and sutured after lithotomy. If much necrosis of the ureter was manifest, as had often resulted from the impaction of a calculus, each case should be treated according to the judgment of the surgeon, and such modifications as resection or exsection, with uretero-ureteral anastomosis or ureterocystostomy might rarely be required. Frequently pyonephrosis accompanied calculous ureteritis. Incision and drainage, and probably nephrolithotomy would be needed in addition. The routes employed depended upon the location of the calculus, the bladder, vagina, or loin being selected. He could only endorse the rectal route, as employed by Ceci, when examination revealed a calculus ulcerating into the rectum or threatening to do so.

For ureteral fistula nothing need be done unless obstruction of the duct below the fistulous opening existed. In such a case the caliber of the canal must be restored. Usually the fistula would then close spontaneously, although so much cicatricial tissue might be deposited about the opening as to prevent closure. Suture or perhaps resection might be required in that case.

Dr. Bovée then referred to subcutaneous injury of the ureter, saying that no treatment was advisable unless evidence of extravasation of urine or of ureteral obstruction existed. For partial division of the ureter suturing should be applicable. Abnormal ureteral terminations of congenital origin might be corrected by ureterocystostomy, usually by the vaginal route. Fortunately in these cases the ureter was abnormally long, and therefore the difficulty was much less than was the same operation for other indications. The ureter might be removed in whole or in part for tumors, tuberculosis, and malignant disease. In 1899 he was able to collect from literature about 24 cases of partial or complete ureterectomy. Now the number had increased to nearly one hundred. In complete ureterectomy or nephro-ureterectomy in women probably the loin and vaginal incisions constituted the best plan. In his last case he separated the lower two inches through a vaginal incision, and then separated and withdrew the kidney and ureter by the loin route. This he believed to be the best of all. For ureteritis the treatment had been largely of irrigation and topical applications. He had been disappointed in this work and had grave doubts of its being the best. Probably the violence done to the lower part of the ureter by this instrumentation counterbalanced the benefits. He had had a few cases of trigonitis that had come to him after ureteral irrigations were said to have been made. He had in consequence been led to speculate as to whether a non-alcoholic, non-nitrogenous diet with diuretics and rest in bed might not be superior treatment for simple ureteritis.

Pus Collections in the Pelvis.—Dr. C. N. Chavigny, New Orleans, La., discussed this subject, in which he reported three cases of mistaken diagnoses.

The Technic of the Vaginal Method.—Dr. J. Riddle Goffe, New York, said in his own hands the scope of the operation, namely, the conditions to which it was applicable, was steadily widening. It was no longer confined, on the one hand, to simple puncture and drainage, nor limited, on the other, to the radical operation of hysterectomy. All the intermediate procedures that were called for by the multifarious pathological conditions found in a woman's pelvis found their most direct route through the vagina. There were two vaginal incisions through which the pelvic cavity could be reached; one, posterior to the cervix into Douglas' pouch, and the other anterior to the cervix, separating the bladder from the uterus and opening up to view and touch the entire contents of the pelvis. The latter was the one which afforded the greater facilities for operative procedures,

and the one which he depended upon almost exclusively. The posterior incision was frequently used in connection with it, to afford additional opportunity for the purpose simply of securing drainage and in some cases for manipulation. The procedure was described. The simplest application of the vaginal method, and the one that probably commended itself most universally to the profession, was incision and drainage of pelvic abscesses. On general principles he believed all were ready to subscribe to the dictum that so far as the patient was concerned, any operation that could be as well done through the vagina as through the abdominal incision was better done along the vaginal route. The possibilities of this work would undoubtedly vary with individual experience, but the more experience he had, the broader became the field of application, until it seemed to him that any pathological condition that was confined to the true pelvis could be dealt with as satisfactorily, with as permanent results, and with far greater safety to the patient through the vaginal incision than through the abdominal incision. The author's cases had embraced every variety of disease from simple retroversion, with or without adhesions, to prolapsed and cystic ovary, unilateral and bilateral salpingitis, ectopic gestation, fibroid tumors of the uterus and dermoid cysts. The method lent itself to every form of conservative work upon the uterus and its appendages that had been suggested in the trend of recent modern gynecology. The successful application of it required patience, experience and skill, but when once the profession had been convinced of its superiority, he believed it would steadily and rapidly grow in favor and become the accepted method for the man who practised the specialty of gynecology.

Tuberculous Ostitis of the Knee.—Dr. A. R. Shands, Washington, D. C., said that the management of a case of white swelling could be embraced in the terms immobilization and protection in any and all stages of the disease. The indication was to preserve the function of the joint as far as possible, to arrest the progress of the disease, to prevent and correct deformities. Immobilization and protection with the best hygienic surroundings and the best tonic treatment appropriate to the individual case would best accomplish the indication just mentioned. If the diagnosis was made early and this line of treatment faithfully carried out, a large percentage of cases would yield very favorable results, many recovering with little or no disability. When it became necessary to incise and drain a joint, it should be done thoroughly and good drainage should be kept up just as long as there was any discharge. When the infection of the joint was due to an ostitis that was near the surface of the ends of the bone, often the diseased bone sloughed away and when it could be easily located and curetted, most excellent results were obtained. A case was cited in point. The operation of excision of the knee should never be done in children, except in extreme cases, and even then the author believed that amputation would be best, for an artificial leg is more useful than such a leg as a child would have after excision.

Bilateral Diffuse Virginal Hypertrophy of the Breasts.—Dr. George Ben Johnston, Richmond, Va., reported the case of a white girl, virgin, aged sixteen years, four feet ten inches tall, weighing 112 pounds, who had this disease. The breasts hung from the chest wall at about the fourth rib and reached to a point just above the symphysis pubis; the nipple was flattened and stretched. The substance was soft and of similar consistence to that of a well-nourished multipara's breast; the glandular masses scattered throughout were distinctly palpable. The breasts were almost symmetrical, with the exception of a lobular division at the base of the left breast of the same general structure as the main tumor. Two small scars near the right nipple indicated the site of former abscesses. The anteroposterior circumference of the left breast was 19¼ inches; the anteroposterior circumference of the right breast was 21¼ inches; the superior inferior circumference of the left breast was 32 inches; and of the right, 31 inches. Operation was performed under ether anesthesia, and occupied thirty-five minutes, the left breast being removed first, followed immediately by the right. The breast was held above the field of operation, and the amputation carried on as rapidly as the vessels could be caught by assistants. Healing was by primary intention, and the patient was up and about in six days.

Dr. George H. Noble, Atlanta, reported a case of excision of the psoas magnus muscle for sarcoma.

The Differential Diagnosis of Syphilis and Cancer of the Vulva.—Dr. Barton Cooke Hirst, Philadelphia, read a paper on this subject. After referring briefly to the differential diagnosis of these two affections, the author reported the case of a woman, twenty-eight years of age, single, who had never been pregnant. She denied ever having led an immoral life, and the possibility of venereal infection. Ten years ago she was operated on in the Pennsylvania Hospital for hemorrhoids and fissure *in ano*. The wound of the operation did not heal properly. More than a year ago the patient noticed an ulcerated condition of the vulva, and a short time afterward incontinence of feces, followed soon by incontinence of urine. For two years past there had been amenorrhea. On a specular and digital examination, a fistula between the fossa navicularis and the rectum was discovered. The whole urethra was gone; there were three little tubercles at the neck of the bladder, these being all that was left of it. The vagina above the neck of the bladder was perfectly healthy. The cervix was normal, except that it was atrophic, as was the whole uterus. The case, at first sight, looked like an inoperable epithelioma of the vulva. It was pronounced to be so by one of the most experienced dermatologists in Philadelphia, to whom it was shown. But there was none of that extensive infiltration and elevation of the skin surface around the edges of the ulceration, such as was seen in an example of extensive epithelioma of the vulva, considerably advanced, but not yet inoperable. Moreover, numerous pieces of tissue from different places in the ulcerated area showed nothing characteristic of cancer. There was everywhere the most extensive round-cell infiltration and necrosis of tissue. The microscopic study, as well as the macroscopic appearance suggested syphilis in the ulcerated gummatous form as the most likely possibility, epithelioma being excluded. Accordingly the patient was put on specific treatment in spite of her negative history, and the entire absence anywhere in it upon her body of signs indicating an old syphilitic infection. The treatment was given up within a week, as the patient was severely ptyalized and could not endure large doses of potassium iodide. Lupus next suggested itself. On two separate occasions, under anesthesia, 12 or 15 pieces of diseased tissue were removed for microscopical examination. No tubercles or bacilli could be discovered anywhere. Inoculations in animals were negative. The urine contained no tubercle bacilli. The bladder itself was healthy. There was a response to the tuberculin test, but the woman had a patch of consolidation in the apex of one lung. Meanwhile the patient was given X-ray treatments every other day for eight to ten minutes. Within three weeks the external ulceration was healed. The local appearance at that time showed great improvement. Two weeks later the rectovaginal fistula spontaneously closed under the continuance of the X-ray applications. Nothing remained of the original disease, except the absence of the urethra

and an elephantiasic condition of the labium majora. The former had been corrected by urethroplasty. He had not yet joined the new urethra to the opening in the bladder, so that the establishment of continence of urine was still doubtful, but he was quite hopeful of making the patient eventually entirely comfortable.

Symposium on Appendicitis.—Dr. George R. Dean, Spartansburg, S. C., read a paper on appendicitis, saying there was not a surgeon who could tell in any given number of cases, in the beginning of the first attack, which ones would have severe attacks, and which light ones; which ones would die without operation, and which ones would recover permanently, which ones would recover to have repeated attacks, or which ones would recover cripples and never have another attack. The surgeon should be called in all cases of appendicitis. He considered it a surgical disease, outside of the pale of the physician, and when it was once discovered there was only one proposition to be made—namely, to urge operation at the earliest possible moment.

Appendicitis and Its Relation to Pelvic Inflammations.—Dr. J. M. Baldy, Philadelphia, was able to appreciate the reasons, although not agreeing with them, of the class of surgeons who removed the vermiform appendix as a routine practice as a prophylactic measure, but was unable to follow the reasoning of that class who adopted the practice of removal on the ground that the condition of adhesion implied appendicitis or future danger of this disease. Ninety-five per cent. of the mixed class were in origin cases of pelvic inflammatory disease, and the adhesion of the vermiform appendix was a mere coincidence due to inflammation of contiguous serous surfaces, as was so commonly the case of adhesion of intestines in pelvic inflammatory diseases. His experience had led him to differ with those gentlemen who held that appendicitis generated pelvic inflammatory disease, or that pelvic inflammatory disease caused appendicitis. The two diseases were rarely associated, and only then as a coincidence. He was firmly of the opinion that the one never causes the other. In all his experience he had not seen a single case in which, having found pus in a Fallopian tube, had he found pus in the involved vermiform appendix; nor had he found a perforating or gangrenous appendix in such a case. On the other hand, where he had found a perforated or gangrenous vermiform appendix, or one which contained pus, either in its cavity or enclosed in its walls, had he ever noticed pus in a Fallopian tube or ovary. Should he meet with such a condition it would appear to him that the two diseases existed as a coincidence independent of each other, as far as direct infection from one to the other was concerned.

Retroperitoneal Infection a Result of Appendicitis.—In a paper on this subject, Dr. I. S. Stone, Washington, D. C., said that it was our plain duty in certain septic cases to investigate the retroperitoneal space with the same care as the cavity of the peritoneum. First, one should consider every delayed case with anxiety, lest there should be retroperitoneal infection. Second, one should be careful to give a guarded prognosis in every case of appendicitis ushered in by or complicated by chills or any symptoms of sepsis. Third, if operating in such cases, one should consider retroperitoneal infection as already started, and act accordingly. The discovery and proper treatment of such infection was quite as important as the usual intraperitoneal technic. In view of the possibilities of retroperitoneal infection, the surgeon assumed great responsibility by advising non-intervention in appendicitis, and while one would often advise delay, when he believed the lesions were strictly intraperitoneal, yet it would appear to the writer that such a course was unsafe and should be condemned when there was reason to fear complications.

Short Incision in Appendicitis.—Dr. Robert T. Morris, New York, said the beginner in surgery was inclined to make incisions that were too short, rendering his work more difficult and very likely incomplete. With the establishment of confidence in his resources, the tendency was to make freer and bolder incisions. The surgeon could not do good work, particularly in abdominal surgery, if he began his work with incisions that were too short. He could not do the best work if he continued to make incisions that were too bold or too free. After one had acquired a certain amount of skill in technic, he could return to the shorter incisions, which would allow the patient to escape with the least possible attack of incision. Even a bear had been known to die from too much incision, and in dealing with patients the incision was of some consequence to them. With long incisions there was more shock; more adhesions, first, because the exposure of the peritoneum through a long incision excited greater inflammatory reaction, and this resulted in more peritoneal adhesions, which must be disposed of, or which might remain to make the patient lifelong trouble. Second, the longer the incision, the greater the danger of infection from the aerial bacteria. With long incisions the patient's general resistance was interfered with. He would make this statement, however, that the surgeon should make as long an incision as he felt was necessary, and by no means be guided by the idea that he was to conform to any length of incision, the idea being that if one could allow the patient to escape with a mild attack of incision, he should do so.

The Significance of and Management of Paralysis of the Bowel.—Dr. Geo. S. Brown, Birmingham, Ala., emphasized the views held by the surgeons of the past generation, that paralysis of the bowel in the presence of inflammation of the peritoneum was to be regarded, not as a pathological condition to be combated, but rather as nature's way of allowing the plastic exudate to form adhesions, the use of which was to confine the infection to as limited a field as possible. He held that it was not the paralysis, but the overdistention of the bowel, that should be fought. By following the plan of keeping the upper uninflamed portion of the bowel quiet, until the inflammation subsided, rather than attempting the difficult or impossible feat of reviving the inflamed and paralyzed portion by the use of purgatives, he believed he would cure many or the majority of the cases of diffuse peritonitis with which the surgeon had to deal. This rest treatment should be applied after the offending appendix or tube had been removed, and the infected site properly treated and drained. It seemed to him that if the Ochsner plan of treatment would tide over a patient with a gangrenous appendix, such a patient could have a much better chance if that appendix were removed, and to the Ochsner treatment were added the tight abdominal binder with water to relieve thirst and wash out the stomach, if there was vomiting, together with opium *ad libitum*, to relieve pain and keep down peristalsis. He believed that many patients died with all the symptoms of general peritonitis following operations for appendicitis where autopsies would show that the inflammation had been walled off, and that death was really due to the activity of the upper bowel, due to the presence of food or purgative, which, being unable to pass the lower paralyzed portion, set up a return wave of peristalsis, causing regurgitant vomiting and death from exhaustion and sepsis. He related two cases in point. Both patients had high fever, great distention and gulping fecal vomit, and the autopsies showed that neither had general peritonitis. One of these patients had been operated upon, the other had not, but both had been given large doses of purgatives. In a total experience of ninety cases of ap-

pendicitis he had had 66 pus cases, 24 of which had been treated by the plan of starvation, except as to water, prolonged irrigation of the stomach before leaving the table, a tight abdominal binder and opium. Eighteen of these patients had more or less diffuse peritonitis, and 12 of these were so severe that they had to be extensively disemboweled in order that adhesions could be broken up and septic material wiped away. Two of these only died. These might have recovered had they been tided over without operation, but as they were both *in extremis* at the time, probably the only thing saved would have been the reputation of the surgeon. Of five other deaths occurring in the ninety cases, two were due to subdiaphragmatic abscess rupturing into the lung, one to regurgitant vomiting, due to the presence of a large quantity of castor oil in the bowel, which was not washed out, and two early cases where abscesses that had already set up a diffuse peritonitis were merely incised.

Septic Thrombosis of the Femoral Vein Following Influenza.—Dr. D. F. Talley, Birmingham, Ala., reported a case of septic thrombosis due presumably to influenza from which the patient was recovering when the phlebitic trouble arose.

Five Recent Successful Laparotomies for Gunshot Wounds of Abdominal Viscera, Including One with Twenty-eight Perforations of Intestines and Mesentery.—Dr. Robert W. Johnson, Baltimore, Md., read a paper with this title, in which he reported five cases. The first was one of gunshot wound of the stomach and liver; laparotomy, with recovery; second, a gunshot wound of the liver; laparotomy, recovery. Third, gunshot wound of the liver; laparotomy, recovery. Fourth, gunshot wound of intestine, laparotomy, recovery. The fifth case was one of gunshot wound of the intestines, in which there were 17 perforations of the gut, 11 of the mesentery. The patient was a colored boy, aged seventeen years. While watching an election row he was shot in the abdomen. When put on the table he presented the appearance of a strong, well-developed negro, composed in manner, but suffering from profound shock. There was no pulse at the wrist, and collapse seemed imminent. Salt solution was injected into the thighs and strychnine given hypodermically. A wound from a 32-caliber ball was found in the left side, just above Poupart's ligament, which, after washing, was found to go directly into the abdominal cavity. A median incision was made below the umbilicus and the belly found to be full of blood. Through this incision the gut was drawn out on to warm towels and seventeen perforations of the small intestine, and eleven of the mesentery, were successfully closed by silk Lembert sutures. Patient had no setback after the operation, and was discharged well three weeks after injury was received.

Cases of Intestinal Obstruction Treated by Resection.—Dr. W. H. Doughty, Jr., Augusta, Ga., reported three successful cases of resection of intestine for obstruction due to gangrenous umbilica hernia, volvulus, and intussusception, respectively. He presented these cases briefly as a contribution to the statistics of an operation, the mortality of which was very high. One of the cases was rather unique, so far as the author knew, in that the strangulated loop of intestine in the hernia was a part of a greater segment which had been strangulated by volvulus. It was likely that the descent of the herniated coil took place shortly after the occurrence of the volvulus, and its strangulation was occasioned by the congestion which followed the latter. The almost invariable fatality which attended the operation he attributed to the toxemia that was induced by gangrene of the intussusceptum. In one case, however, which he outlined, in spite of the unmistakably gangrenous patches upon the intussuscipiens and involving even the mesentery, the patient, though far from being in a satisfactory condition, stood the operation fairly well, rallied promptly from the depression which attended it, and recovered without interruption.

Free Growths in the Tunica Vaginalis.—Dr. Edward A. Balloch, Washington, D. C., reported the case of a colored boy, sixteen years of age, who came under his care in December, 1902. Family and personal history threw no light on the case. There was no history of injury. Present trouble began eight years before, as an enlargement in the upper part of the right of the scrotum, which continued to grow painlessly from that time onward. Examination showed a scrotum reaching nearly to the knees and measuring twenty-one inches in circumference at its largest point. Both testicles and both cords could be made out and felt normal as to size, shape and consistence. There was no fluid in the scrotum, but a peculiar gelatinous, flabby feeling of the scrotal tissue. Three separate tumors were felt in the right side of the scrotum. The growths were freely movable in relation to cord, testis, and scrotal tissues. The diagnosis of fibroid growths in the tunica vaginalis was based partly on the history of a slow, painless growth, and absence of ulceration and fistulæ, excluding cancer, syphilis, and tuberculosis, and partly on the physical characteristics of the growths, together with a keloid behind the right ear, which was interpreted as indicating a tendency to fibromatosis in the patient. Operation, Dec. 15, 1902, showed the tunica greatly enlarged and thickened, and converted into a gelatinous mass. The upper tumor ran into the inguinal canal and was attached there by a pedicle. The other two showed no distinct points of attachment. All the tumors were enucleated and the thickened tunic removed. The testicle was removed accidentally in dissecting out the tunica. The tumors weighed 38 ounces, and the tunica 20 ounces. The specimens were shown. The report of the pathologist showed that the growths were soft fibromata, with areas of fatty and myxomatous degenerations. The testicle also showed areas of beginning myxomatous degeneration. The pathology of the condition was considered briefly, the conclusion being reached that the growths had their origin in the subserous connective tissue. Examination of the literature showed but one case at all resembling the one reported, although there were several reports of minute fibrous growths on the tunic following hydrocele treated by the injection of iodine.

Dr. J. McFadden Gaston, Jr., Atlanta, Ga., dealt with the complications encountered in the surgical treatment of the testicle.

Extrauterine Pregnancy.—Dr. T. J. Crofford, Memphis, Tenn., reported a case and exhibited a specimen in which the gestation sac was so thoroughly developed and so strong, that it was enucleated without the loss of any blood. The sac was completely intact all around the fetus. The operation was performed before the class. The speaker supposed it to be a parovarian cyst. After the specimen was removed, it was thrown upon the floor. When the patient was put to bed, the sac was slit open and out came the fetus. When the abdomen was opened in this case, the head of the cecum was found in front and adherent to the anterior abdominal wall. It was found necessary to remove the appendix.

Colloid Carcinoma of the Rectum with Excision by the Combined Vaginal and Inguinal Routes.—Dr. J. Horace Whitacre, Cincinnati, Ohio, reported a case of colloid carcinoma of the rectum which presented unusual pathological and clinical features. After detailing a complete history of the case and describing the operation, the author stated that his chief reason for presenting the case was the unusual nature of the primary tu-

mor. He had never before seen a carcinomatous tumor of the bowel which had developed as a hard, uniform thickening of the entire circumference of the tube. The tumor involved the wall of the rectum to almost a uniform degree for six inches in its length, and the organ was transformed into a tube that might very well be compared to a flattened lead pipe with very thick walls. The tube was very rigid and non-collapsible when in a fresh state. The lumen of the tube was unfortunately firmly packed with gauze before it was placed in Kaiserling's preservative fluid, and had been thereby dilated to almost twice its actual size during life. A second point of interest was the strong naked eye resemblance to tuberculosis. The minute bodies which were scattered over the pelvic peritoneum could not be differentiated from miliary tubercules. Large caseous lymphnodes were found in the hollow of the sacrum. The great predominance of fibrous tissue, the uniform involvement of a long segment of the bowel, and the appearance of minute nodules resembling miliary tubercles in the primary tumor of the rectum all spoke for hyperplastic tuberculosis of the bowel. A third point worthy of mention was the exceedingly rapid development of the solidly carcinomatous ovarian tumors from half a dozen minute miliary metastases on the peritoneal surfaces of each. These tumors were friable and almost jellylike, as were all of the metastases, whereas the original tumor was as hard as cartilage.

Pneumatic Rubber Suit.—Dr. George W. Crile, Cleveland, Ohio, said that the pneumatic rubber suit was constructed of a double layer of specially made rubber, which, when inflated, exerted a uniform pressure upon the surface, constituting an artificial peripheral resistance. It was so constructed that one or more limbs or the abdomen might separately or in combination be subjected to pressure by inflation by means of a bicycle pump. The air valves were so adjusted that the rate of decompression might be completely controlled. The effect of the suit upon the blood pressure might be checked by means of a sphygmomanometer. The general blood pressure might be varied at will within a range of 25 to 75 mm. of mercury. The rise had been sustained as long as twelve hours. In operations upon the head and neck, which were likely to be attended by dangerous shock and collapse, the pneumatic suit was put on the patient prior to operation. By inflation and deflation the blood pressure might, within certain limits, in the heaviest operations, be maintained at a given level. In a laryngectomy with extensive resection of lymphatic-bearing tissue of the neck moderate shock developed. The blood pressure was raised by means of the rubber suit, which soon sprung a leak; a marked fall in the blood pressure following. During the experimental stage the influence of the pneumatic suit upon the blood pressure was strikingly demonstrated in a pulseless case in which the blood pressure was raised to 110 mm. Other cases were reported, showing the value of the pneumatic rubber suit in cases of shock and collapse.

Resuscitation of Animals Apparently Dead.—Dr. Crile also read a short paper on this subject, giving a summary of experimental data. When asphyxia caused failure of the heart and respiration, vigorous artificial respiration usually restored their function when administered within a few seconds. It was effective in an inverse ratio to the time that had elapsed; it was rarely effective after forty seconds. By the addition of saline infusion a larger proportion of animals could be resuscitated after the lapse of a little longer time. Rhythmic pressure upon the heart, either through the thorax by pressure upon the ribs over the heart or direct pressure within the thorax was also an aid. The effect of the traumatism to the heart by the direct method partially counterbalanced the benefit from this measure. Nitroglycerin, alcohol and digitalis were useless; rapidly alternating the posture, head up, then head down, was not effective. Suspending the animal head down and making rhythmic pressure upon the heart was an effective method. This method gave the brain the advantage of gravity; it provided a moderate artificial circulation, as well as respiration. It could be promptly applied. The addition of saline infusion increased the effectiveness of the method. Animals apparently dead for periods up to fifteen minutes were resuscitated by the combined effect of artificial respiration, rhythmic pressure upon the heart, and the infusion of adrenalin. When the blood pressure had risen to 30 or more mm. Hg, the heart began to beat and the blood pressure was rapidly restored. The return of respiration was signaled by a short, almost imperceptible movement of the diaphragm, the respiratory action becoming gradually stronger and more frequent. The conjunctival reflex returned early. Some of the experiments failed on account of too great elevation of the adrenalin bottle; some on account of an overdose of adrenalin; several were only partially successful, owing to the great dilution of the adrenalin. Adrenalin, when injected directly into the chamber or into the wall of the heart, caused fibrillar contractions, after which the heart could not be resuscitated. After final cessation of the heart, by employing manual compression of the heart and infusing adrenalin, the blood pressure could be raised even higher than the normal. Respiration in some instances was partially restored. Experiments in which saline infusion was substituted for adrenalin, and which were unsuccessful, were promptly successful on adding adrenalin. In a patient with crushed skull, and whose heart had ceased beating for nine minutes, resuscitation of the heart for thirty-one minutes by this method was made. During the operation for the elevation of the depressed bone, the patient moved his head.

Officers for the Ensuing Year.—The following officers were elected: President, Dr. Floyd W. McRae, Atlanta, Ga.; First Vice-President, Dr. Geo. S. Brown, Birmingham, Ala.; Second Vice-President, Dr. J. Shelton Horsley, Richmond, Va.; Treasurer, Dr. Chas. M. Rosser, Dallas, Tex.; Secretary, Dr. W. D. Haggard, Nashville, Tenn. Birmingham, Alabama, was selected as the place for holding the next annual meeting; time, Dec. 13, 14 and 15, 1904. Dr. John D. S. Davis, Birmingham, was selected as the Chairman of the Committee on Arrangements.

The Council made a report to the effect that the former action of the Association in appropriating $2,000 to a memorial in Birmingham, consisting of a ward bearing the name of the Association in the City Hospital of Birmingham, be rescinded, and that in lieu thereof $2,000 be appropriated to the erection of a monument to the memory of Dr. W. E. B. Davis in Birmingham. The report of the Council was adopted.

BOOK REVIEW.

NURSES' GUIDE TO SURGICAL BANDAGING AND DRESSINGS. By WM. JOHNSON SMITH, F.R.C.S. Principal Medical Officer, Seamen's Hospital, Greenwich. J. B. Lippincott Company, Philadelphia; the Scientific Press, Limited, London.

ALTHOUGH intended for nurses, this would make an excellent volume to put in the hands of the medical student, as his first introduction to the underlying principles of asepsis, the treatment of wounds, etc. It is interestingly written, like most English books, and profusely illustrated, especially in the section on bandaging, and we can heartily recommend it.